

RECLAMATION

Managing Water in the West

Folsom Dam Road Access Restriction Draft Environmental Impact Statement



U.S. Department of the Interior
Bureau of Reclamation
Central California Area Office
7794 Folsom Dam Road
Folsom, CA 95630

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Draft

**ENVIRONMENTAL IMPACT STATEMENT
FOLSOM DAM ROAD ACCESS RESTRICTION
FOLSOM, CALIFORNIA**

Lead Agency:

**U.S. Department of the Interior
Bureau of Reclamation, Central California Area Office
Folsom, California**

Technical Assistance Provided by:

URS Corporation
Fehr & Peers Associates
Public Affairs Management
Northwest Economics Associates
Brown Buntin Associates

This Draft Environmental Impact Statement (EIS) is prepared in compliance with the National Environmental Policy Act (NEPA) and U.S. Bureau of Reclamation (Reclamation) NEPA procedures.

Reclamation indefinitely closed Folsom Dam Road for security reasons on February 28, 2003, to preserve and protect the core mission of Folsom Dam and Reservoir and to assure the ultimate safety of the public downstream of the facility. The closure followed a series of security reviews, including a final review conducted by the Defense Threat Reduction Agency (DTRA) and subsequent full-scale analysis and evaluation of DTRA's recommendations by Reclamation and the Department of the Interior. The evaluation determined that continued uncontrolled access along Folsom Dam Road presented a security risk to the facility and public. Prior to its closure, Folsom Dam Road served as one of three key routes across the American River water bodies of Lake Natoma and Folsom Lake. The City of Folsom and the surrounding Sierra Nevada foothill communities constitute one of the fastest-growing regions in the state, and existing roadways have experienced increasing congestion problems. Folsom Dam Road had become a well-used route by Folsom residents and commuters from adjoining communities. In response to the road closure and traffic growth, the City of Folsom implemented a traffic "calming program" and specific traffic measures to improve conditions at key intersections while limiting flow through some neighborhood locations by restricting and diverting traffic back onto the increasingly congested primary roadways. This EIS discusses these changes and conditions. Also evaluated under future cumulative conditions is a separate reasonably foreseeable project being advanced by the U.S. Army Corps of Engineers for a new bridge parallel to and below Folsom Dam Road, which if completed would carry much of the traffic that formerly crossed the dam.

Four alternatives have been carried forward in this EIS: a Preferred Alternative to indefinitely maintain the closure of Folsom Dam Road, two alternatives that involve restricted or controlled access across the road, and a No Action Alternative that would reopen the road. The impact areas evaluated include traffic, air quality, noise, economic and social conditions, water resources and supply, biological resources, energy and power supply, recreation, and cultural resources.

Comments on this Draft EIS and inquiries regarding additional information should be directed to: Mr. Robert Schroeder, U.S. Bureau of Reclamation, Central California Area Office, 7794 Folsom Dam Road, Folsom, California, 95630, (916) 989-7274.

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List of Acronyms and Abbreviations

$\mu\text{g}/\text{m}^3$	microgram per cubic meter
Caltrans	California Department of Transportation
CAP	Clean Air Plan
CARB	California Air Resources Board
CDFG	California Department of Fish and Game
CFR	Code of Federal Regulations
CNDDDB	California Natural Diversity Data Base
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	carbon monoxide
CSUS	California State University, Sacramento
dB	decibel
dBA	A-weighted sound pressure level (in decibels)
DTRA	Defense Threat Reduction Agency
EIS	Environmental Impact Statement
ESU	Evolutionarily Significant Unit
FHWA	Federal Highway Administration
FICON	Federal Interagency Committee on Noise
HAP	hazardous air pollutant
HCM	<i>Highway Capacity Manual</i> (Transportation Research Board 2000)
ISO	(California) Independent System Operator
km	kilometer
kW	kilowatt
L_{dn}	day/night average sound level
L_{eq}	equivalent sound level
L_{max}	maximum noise level recorded during a noise event
L_n	sound level exceeded “n” percent of the time during a sample interval (L_{90} , L_{50} , L_{10} , etc.)
LOS	Level of Service
MTP	Metropolitan Transportation Plan
MTIP	Metropolitan Transportation Implementation Plan
MW	megawatt

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NAC	Noise Abatement Criteria
NEPA	National Environmental Policy Act
NO ₂	nitrogen dioxide
NOI	Notice of Intent
NO _x	oxides of nitrogen
O ₃	ozone
PM ₁₀	particulate matter less than 10 micrometers in diameter
PM _{2.5}	particulate matter less than 2.5 micrometers in diameter
ppm	part per million
Protocol	<i>Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects (Caltrans 1998)</i>
Reclamation	U.S. Department of the Interior, Bureau of Reclamation
ROG	reactive organic gas
SACMET	Sacramento Regional Travel Demand Model
SACOG	Sacramento Area Council of Governments
SJWD	San Juan Water District
SIP	State Implementation Plan
SMAQMD	Sacramento Metropolitan Air Quality Management District
SO ₂	sulfur dioxide
SRA	State Recreation Area
TAC	toxic air contaminant
US-50	U.S. Highway 50
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VMT	vehicle miles traveled
vpd	vehicles per day

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The *Folsom Dam Road Access Restriction Draft Environmental Impact Statement* (EIS) is a planning document that describes and analyzes human and environmental issues associated with alternatives for long-term vehicular access on Folsom Dam Road. The EIS has been prepared in compliance with the National Environmental Policy Act (NEPA).

This section presents a summary of the EIS. Included in this summary is the purpose and need for the EIS, which identifies the driving forces and scope of the document. This section also provides a synopsis of the four project alternatives analyzed in detail in the EIS, a brief description of the environmental impacts of those alternatives, and a list of potential mitigation measures that may reduce the severity of impacts, where practicable.

PURPOSE AND NEED

When Folsom Dam was built in 1956, a two-lane maintenance road was constructed atop the crest of the dam. This road eventually became known as Folsom Dam Road. The road was designed to provide access to the facility and to the industrial complex that houses the administrative resources necessary to operate and maintain the water delivery and flood protection services of the dam. Prior to the construction of Folsom Dam, the U.S. Army Corps of Engineers (USACE) consulted the California Highway Commission regarding the necessity for a public highway crossing over Folsom Dam. The California Highway Commission did not see a need for a public highway across the dam at the time. Accordingly, no State route has ever been designated, and Folsom Dam Road has never been officially certified nor dedicated for use by the general public.

The U.S. Department of the Interior, Bureau of Reclamation (Reclamation) is responsible for operating and maintaining Folsom Dam and Reservoir in a manner that ensures the benefits envisioned in its authorizing statute. Over the years, Reclamation has had to close Folsom Dam Road intermittently for dam rehabilitation and maintenance work. On February 28, 2003, Reclamation indefinitely closed Folsom Dam Road for security reasons, to preserve and protect the core mission of Folsom Dam and Reservoir and to ensure public safety in the vicinity of the dam and other parts of Sacramento County.

The road closure followed a series of security reviews, including a final review conducted by the Defense Threat Reduction Agency (DTRA) and subsequent full-scale analysis and evaluation of DTRA's recommendations by Reclamation and the Department of the Interior. These documents contain classified information and are not part of this EIS. The evaluation demonstrated that continued uncontrolled access along Folsom Dam Road presented a security risk to the facility and to the public. In response, Reclamation began developing a comprehensive, long-term security plan. A key element of the plan includes, but is not limited to, a long-term solution for the future of vehicular access on Folsom Dam Road. That is the subject of the proposed action and of this EIS.

The **purpose and need** for this action is to:

- Control access to Folsom Dam, including all traffic on Folsom Dam Road
- Minimize the security risks and maximize the safety of Folsom Dam and of the entire Sacramento metropolitan area downstream of the dam

PUBLIC PARTICIPATION PROCESS

The NEPA process requires early and open communication with the public and interested parties, including local governments, to identify environmental issues related to the proposed action. Referred to as scoping, the initial steps of the NEPA process help define the human and environmental impacts that were evaluated and addressed in the environmental review documentation process. The public scoping process included the following actions:

- A Notice of Intent (NOI) to prepare an EIS (Bureau of Reclamation NOI 4310-MN-P) was published on April 5, 2004.
- A Folsom Dam Road Closure EIS Web page was established at <http://www.usbr.gov/mp/cao/roadeis/> with information about the EIS process and an e-mail link to submit written comments to Reclamation.
- Two scoping meetings were conducted in May 2004. These meetings were held to solicit input from the public, interested parties, and agencies on critical environmental issues.

Two hundred and forty-two comments and a petition with 220 signatures were received as of July 2004. These comments were summarized and were considered in the environmental analysis.

SUMMARY DESCRIPTION OF PROPOSED ALTERNATIVES

Four alternatives are analyzed in this EIS: the No Action Alternative, the long-term closure of Folsom Dam Road, and two restricted access alternatives that involve partially opening Folsom Dam Road to public access (Restricted Access Alternatives 2 and 3). The features of the four alternatives analyzed in this document are summarized in Table ES-1.

The Preferred Alternative in this Draft EIS is the immediate permanent closure of Folsom Dam Road.¹ However, identification of that alternative for purposes of the Draft EIS does not foreclose the option of selecting, in the Final EIS and Record of Decision (ROD), a reopening of the road to weekday commuter traffic pending completion of the Folsom Dam Bypass (discussed in Alternatives Considered but Eliminated from Further Consideration and Sections 3.1 and 3.11.2). Reclamation has identified potential environmental, economic, and quality of life effects of full closure of Folsom Dam Road that may occur before the new bridge over the American River can be opened to traffic.

No Action Alternative

The No Action Alternative provides the baseline conditions for the environmental analysis, as required by NEPA. The No Action Alternative refers to access conditions that existed prior to the indefinite road closure of February 28, 2003. As such, the No Action Alternative involves reopening Folsom Dam Road to provide access at pre-February 2003 levels. No physical alteration of the road or additional restrictions on traffic flow would be undertaken. Traffic would be allowed on the road 7 days per week, 24 hours per day. Pre-February 2003 security

¹ The concept of the “preferred alternative” is different from the “environmentally preferable alternative,” although in some cases one alternative may be both. Section 1502.14(e) of the Council on Environmental Quality Regulations requires the EIS to “identify the agency’s preferred alternative if one or more exists, in the draft statement, and identify such alternative in the final statement.”

patrols would be reinstated. Periodic, short-term road closures (as occurred before February 2003) would be needed for routine and/or emergency dam maintenance activities and construction of flood control improvements.

**Table ES-1
Summary Comparison of Alternatives**

	No Action Alternative	Preferred Alternative	Restricted Access Alternatives	
			Alternative 2	Alternative 3
Days Open	7 days/week	None	Monday–Friday	Monday–Friday
Hours Open	24 hours	None	3-hour peak periods, both AM and PM (e.g. 6–9 AM, 4–7 PM) ²	2-hour peak periods, both AM and PM (e.g. 6–8 AM, 4–6 PM) ²
Traffic Directional Flow	Two-way	None	Two-way	One-way
Vehicle Restrictions	Passenger cars, motorcycles, trucks under 5.75 tons (11,500 pounds) gross weight only	No public access	Passenger cars, motorcycles, and noncommercial pickups only	Passenger cars, motorcycles, and noncommercial pickups only
Desired Hourly Volume	Not restricted	None	1,500 vehicles	500 vehicles
Consistency With Purpose and Need	This alternative does not meet the purpose and need of the proposed action.	The Preferred Alternative meets the purpose and need of the proposed action.	Alternative 2 controls access, reduces risks, and increases safety compared to the No Action Alternative. It is consistent with the purpose and need of the project, but does not minimize the risk or maximize safety in comparison to the other action alternatives.	Alternative 3 further reduces risk compared to Alternative 2 and the No Action Alternative. It is consistent with the purpose and need of the proposed action. It does not minimize the risk or maximize safety to the extent of the Preferred Alternative.

As the No Action Alternative neither controls access on Folsom Dam Road nor minimizes the security risks associated with Folsom Dam, Reclamation has determined that it does not meet the purpose and need of the proposed action.

Risk of Dam Failure. As described above, under the No Action Alternative, vehicular access would be restored to pre-February 2003 levels. Security reviews conducted by Reclamation and other independent reviewers indicate that those conditions present a heightened risk of a dam failure. Under this scenario, there would be an increased threat to public safety both in the immediate vicinity of the dam and over a larger area of Sacramento County.

As part of this EIS, Reclamation has completed a review of the magnitude and severity of the risk associated with potential dam failure. Information from that review cannot be publicly disclosed, but knowledge of general types of consequences was used to compare and describe impacts of the No Action Alternative to the other alternatives throughout this document. Analysis and information that was developed for the impact analyses but could not be disclosed can be found in Appendix D. That appendix is occasionally referred to in this EIS but is unavailable for public circulation.

Preferred Alternative

The Preferred Alternative is the long-term closure of Folsom Dam Road between Folsom-Auburn Road and East Natoma Street. Under this alternative, no public access to Folsom Dam Road would be allowed. Essentially, the current road closure would continue indefinitely. Only authorized Reclamation, law enforcement, and emergency access vehicles would be permitted on Folsom Dam Road for maintenance, security, and emergency reasons.

As the Preferred Alternative restricts all public vehicular access on Folsom Dam Road and minimizes the security risks to Folsom Dam, it is consistent with the stated purpose and need.

Restricted Access Alternatives 2 and 3

For any action alternatives that allow reopening Folsom Dam Road to public access, Reclamation has identified a set of conditions that must be met:

- Vehicles traveling across the dam must be inspected.
- The alternative must allow for periodic closures of Folsom Dam Road so that dam-related operations and maintenance work can occur without difficulty.
- Pre-February 2003 limits on vehicle size and restrictions on pedestrian and bicycle access must be reinstated.
- Emergency access must continue across Folsom Dam Road.
- The risk of liability to Reclamation from accidents and other mishaps that may occur with public use of Folsom Dam Road must be mitigated.
- The cost and scheduling impacts of road maintenance and repair to Reclamation must be mitigated; assignment of costs may be negotiated between the City of Folsom and Reclamation.

In addition to the operational conditions noted above, other conditions may apply depending on the alternative selected. The two partial road-opening alternatives analyzed in this document were developed based on input from the City of Folsom.

Under both Restricted Access Alternatives 2 and 3, vehicle access would be limited to peak commute periods. While the exact nature and design of the inspections have not been fully defined, these alternatives propose prescreening through a permitting process coupled with random physical inspections.

The three major differences between Restricted Access Alternatives 2 and 3 are: (1) the capacity or rate of traffic that will be inspected, (2) the operating hours of Folsom Dam Road, and (3) the

directional flow of traffic (Table ES-1). The difference in rate of traffic flow would be based on the number of inspection facilities or method of inspection, which determines how many cars per hour can be inspected and cleared to cross the dam.

Both Restricted Access Alternatives provide some degree of control over vehicular access to Folsom Dam Road but may not necessarily include the same level of inspection for each vehicle. They also incorporate inspection facilities, a design feature intended to minimize security risks to Folsom Dam.

Given the rate at which vehicles would have to pass through the inspection facilities and the sheer volume of vehicles traveling on Folsom Dam Road under each alternative, some measure of risk to the facility would still remain. It is emphasized that the Restricted Access Alternatives described and evaluated in this EIS are based on objectives and concepts proposed by the City of Folsom and other State and local entities, with input from Reclamation. Reclamation has not made a final determination based on security review as to whether these alternatives provide a sufficient level of safety for the dam. Nevertheless, for purposes of this EIS, both Restricted Access Alternatives are considered consistent with the purpose and need and are reasonable alternatives that can be implemented.

RELATED ACTIONS AND CUMULATIVE IMPACTS

Eight related completed and/or planned actions have been identified that are likely to contribute to cumulative impacts when combined with the effects of the Folsom Dam Road Access Restriction. They include the following:

- Lake Natoma Crossing
- Folsom Historic District Traffic Calming Program
- Folsom Dam Bypass
- Folsom Dam Outlet Modification
- Folsom Dam Raise
- Folsom Redundant Water Supply Intake
- Embankment Dams and Dikes Static Modification
- Concrete Dam Seismic and Static Modification

Each of these actions is described in Section 3.11.2. Since they were identified prior to the indefinite closure of Folsom Dam Road in February 2003, it was anticipated that temporary road closures on Folsom Dam Road would be necessary for the latter six actions, which have not been completed. While the duration of the road closures would vary, all actions sought to avoid work during peak commute hours. Additional transportation projects in the vicinity may also require road closures on Folsom Dam Road.

It can be assumed that under the No Action Alternative, road closures varying in duration and timing would be necessary to complete the planned actions. These intermittent road closures would lead to impacts similar to those under the Preferred Alternative and Restricted Access Alternatives 2 and 3, albeit on a temporary basis. Therefore, adverse cumulative effects would occur to traffic and related resources under the No Action Alternative.

Under all action alternatives, necessary closures would be avoided (the road would already be closed, at least partially) and the actions listed above would not create adverse cumulative impacts. Although Folsom Dam Road would be partially open under Restricted Access Alternatives 2 and 3, it would not be open during nonpeak and weekend hours, when work-related closures would have been necessary.

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER CONSIDERATION

Three other alternatives were considered but not advanced for detailed analysis in this EIS. One alternative forwarded to Reclamation by the City of Folsom proposed to open the road to public traffic on a controlled basis with inspection of vehicles (referred to as Scenario 1). Similar to Restricted Access Alternative 2, Scenario 1 proposed to allow two-way public access for passenger cars, motorcycles, and noncommercial pickup trucks, 7 days per week for 3-hour peak commute travel times from Monday through Friday. Unlike the alternatives considered, however, Scenario 1 also called for vehicular access from 9 AM to 5 PM on weekends, with up to 2,000 vehicles traveling on Folsom Dam Road per hour (in both directions) at all times that the road is open. Reclamation considered this alternative but determined that this traffic volume could not reasonably be accommodated under its security inspection conditions. Therefore, Reclamation has determined that security risks would not be minimized and this alternative would not be consistent with the purpose and need.

Both a temporary and permanent new bridge have been considered in the past, below Folsom Dam and upstream of the Riley Street crossing (Rainbow Bridge). This additional crossing of the American River (now referred to as the Folsom Dam Bypass Project) is currently under evaluation by the USACE. Assuming it is fully funded and approved for construction, is anticipated to be operational in 2007/2008. The bridge was considered as an alternative to the Folsom Dam Road Access Restriction but was rejected from further review with regard to this EIS process. By itself, this alternative would not address the immediate and basic purpose and need of controlling access on Folsom Dam Road, which formed the basis of the road closure in 2003. The decision to close Folsom Dam Road for security and safety purposes is separate and independent from providing or maintaining traffic capacity and circulation, which is the objective of the Folsom Dam Bypass Project. Even if considered as an alternative, the Folsom Dam Bypass would not be in place sooner than 2007. For these reasons, the City of Folsom and other local jurisdictions have proposed restricted use of Folsom Dam Road until the bypass is completed, and those Restricted Access Alternatives are considered in this EIS. The Folsom Dam Bypass Project is discussed in greater detail in Sections 3.1 and 3.11.2.

A third alternative was considered based on comments received during the public scoping process. This alternative would allow access for pedestrian and bicycle traffic only on Folsom Dam Road. However, this alternative was found to be infeasible because it would violate existing city ordinances on bicycle and pedestrian safety.

SUMMARY OF ENVIRONMENTAL IMPACTS AND POTENTIAL MITIGATION

Implementation of the four alternatives analyzed in the EIS would have various impacts. These impacts are identified and discussed in detail (by resource area) in Section 3. The potential effects of the proposed action are summarized in Table ES-2, which appears at the end of this section. In general, the greatest effects from the action alternatives considered relate directly or

indirectly to traffic and potential changes in traffic congestion. Other potential effects may occur during construction of inspection facilities under Restricted Access Alternatives 2 and 3 (Table ES-2). All impacts from action alternatives are compared against the No Action Alternative, the baseline case. Impacts associated with each of the resource areas analyzed are summarized below.

For all resource areas, the risk of potential dam failure is highest under the No Action Alternative and lowest under the Preferred Alternative. Although dam failure is not an immediate or direct impact of the No Action Alternative, if it occurs, its impacts would supersede effects associated with any of the action alternatives. This assumption is taken into account under all analyses.

Transportation (Traffic)

Before the February 2003 closure of Folsom Dam Road, many roadway segments and intersections in the vicinity experienced levels of service below the standard defined as acceptable by the City of Folsom's General Plan. Nevertheless, the Preferred Alternative and Restricted Access Alternatives 2 and 3 would further reduce the level of service in some instances based on modeling results for 2005 (Table ES-2). The following roadway segments and intersections would experience reductions in level of service compared to the No Action Alternative:

Roadway Segments

- Folsom-Auburn Road (between Folsom Dam Road and Inwood Road)
- Folsom-Auburn Road (between Oak Avenue Parkway and Greenback Lane)
- Natoma Street (between Folsom Boulevard and Sibley Street)
- East Natoma Street (between Cimmaron Circle and Folsom Dam Road)

Intersections

- Folsom-Auburn Road/Oak Avenue Parkway
- Riley Street/East Natoma Street
- Folsom Boulevard/Natoma Street

In addition, comparison of collision data provided by the City of Folsom for periods immediately before and following the road closure indicates that the number of traffic accidents in Folsom increased after the road closure. Although this may be a function of several factors including continued growth, the increase in accidents may also be a result of greater congestion on the roadways listed above. Proposed mitigation is summarized in Table ES-2 and discussed in detail in Section 3.1.3. Potential mitigation measures include various improvements to the intersections listed above, increasing existing and future transit service, and promoting ridesharing.

Air Quality

Under the No Action Alternative, traffic conditions would be restored to pre-February 2003 levels. In that case, at a regional level, criteria pollutant levels for ozone (O₃) and particulate matter 10 micrometers in diameter (PM₁₀) and smaller would not meet Federal or State ambient

air quality standards. On the other hand, the regional air basin is in attainment for carbon monoxide (CO). Maximum modeled concentrations indicate that the No Action Alternative would not exceed applicable standards for CO.

Under the Preferred Alternative, vehicles would travel additional miles within the Folsom area as compared to the No Action Alternative. As a result, the Preferred Alternative would result in an increase in total emissions for all pollutants for the years 2003 and 2005. The difference in emissions is less than 1 pound per day across the Folsom regional area for most pollutants and approximately 3 pounds per day for nitrogen oxides (NO_x). Carbon monoxide shows the greatest difference at 15 to 18 pounds per day, but modeling of maximum concentration levels shows that CO would not exceed national or State standards. For these reasons, the Preferred Alternative is not expected to cause an exceedance or add to an exceedance of the ambient air quality standards for CO, NO_x, PM₁₀, or O₃. By 2013, regional and local emissions would decrease assuming that the Folsom Dam Bypass is operational.

Under Restricted Access Alternatives 2 and 3, some vehicular traffic would be allowed across Folsom Dam Road, though not at the same capacity as under the No Action Alternative. The total vehicle miles traveled would be slightly higher than under the No Action Alternative. This would result in a slight increase (in overall emissions) in 2003 and 2005 and a slight decrease in 2013. Both of the Restricted Access Alternatives would have lower total emissions than the Preferred Alternative and would not affect the current status of any of the criteria pollutants with respect to attainment or maintenance of nonattainment classification. Traffic congestion would be slightly improved with respect to the key intersections evaluated, and both alternatives would have CO concentrations below the Federal and State standards.

No mitigation is proposed for air quality impacts under the action alternatives because no exceedances of air quality standards would result from their implementation.

Noise

Traffic noise already exceeds local criteria at most of the locations evaluated in the City of Folsom. Under the action alternatives (Preferred Alternative and Restricted Access Alternatives 2 and 3), the changes in traffic-generated noise would not be perceptible at most locations. Increases in traffic noise would be approximately 2 decibels² at some locations along three roadway segments:

- Natoma Street between Folsom Boulevard and Sibley Street
- East Natoma Street between Cimarron Circle and Folsom Dam Road
- Folsom-Auburn Road between Folsom Dam Road and Inwood Road

Potential mitigation for this noise increase was assessed and determined to be infeasible or ineffective. Measures considered included constructing noise barriers (ineffective because of the need to create substantial gaps for driveway access and the agreements needed with all private property owners to implement the measure), acquiring property or interest, using traffic management measures, and insulating and/or air-conditioning public use or nonprofit institutional structures.

² This is considered an approximate threshold for perceiving an audible or noticeable change in noise.

Economic and Social Conditions

The No Action Alternative assumes that population and commercial growth would continue at the rate planned by the City of Folsom's land use development models. As a result, economic output and population (which would generate more traffic) projected under the No Action Alternative are higher than under pre-February 2003 conditions.

Following the February 2003 road closure, 177 businesses were surveyed that are located on streets most directly affected by the road closure. These businesses reported experiencing revenue losses of approximately 21 percent. Data were not available to determine to what extent these revenue losses may be offset by increased revenue elsewhere in the city or county. Furthermore, other factors that may have affected revenue losses such as business competition, industry demand, and regional economic conditions were not quantitatively factored into the analysis. The analysis indicates that revenue losses of up to 21 percent may have occurred in the immediate affected area after the February 2003 road closure, but it remains uncertain what portion of these losses can be directly attributed to the closure of Folsom Dam Road. This impact applies to the Preferred Alternative.

Under Restricted Access Alternatives 2 and 3, when compared to the No Action Alternative, there would also be some revenue losses to businesses directly affected by changing traffic patterns. However, the impacts would be only marginally less than under the Preferred Alternative because the road would remain closed during nonpeak and weekend hours.

Reclamation has no legal obligation to mitigate for potential impacts associated with the closure of a Reclamation maintenance and facility-access road. However, potential mitigation options have been raised or requested. This EIS identifies economic changes or trends that are reported along some of the roads where traffic impacts or changes have occurred after the closure of Folsom Dam Road and shows that these effects vary by location, business sector, and individual business. In cases where a business claims to have suffered direct losses associated with increased vehicular traffic and congestion from the Preferred Alternative, that effect would have to be individually evaluated based on a review of specific sales revenue and other data, and the effect would have to be disassociated from other cumulative contributing factors such as those mentioned above. The Preferred Alternative and the Restricted Access Alternatives are under consideration because of an overall security directive, and no compensatory mitigation review program exists or has been authorized by Reclamation for security actions or for the Folsom Dam Road Access Restriction. As a result, even if mitigation were to be assigned to an individual impact, funding for such measures would require additional approvals.

Water Resources and Supply

The No Action Alternative would not result in any direct change in surface water runoff, either in terms of quantity or quality. The Preferred Alternative would not directly alter water quality or supply. Minor secondary impacts may result due to the fact that more vehicle miles would be traveled in Folsom and air pollutants may increase in surface water runoff from roads as a result of long-term road closure and changing traffic patterns. Under Restricted Access Alternatives 2 and 3, effects similar to the Preferred Alternative would result, though to a lesser degree because of the relative traffic changes. However, under these alternatives, construction of inspection facilities would also be required.

No feasible mitigation measures were identified that would specifically address water resource impacts. Traffic mitigation may improve traffic flow, which would in turn reduce secondary impacts to water quality.

Biological Resources

Under the No Action Alternative and Preferred Alternative, no adverse impacts to biological resources would occur. Restricted Access Alternatives 2 and 3 may have the potential for construction-related impacts although none is anticipated. Vegetation and habitat types in the area have been previously disturbed, and no special-status species or wetlands are currently reported or known to occur in the immediate area of Folsom Dam Road. Nevertheless, if either of these alternatives is implemented, focused surveys would be conducted for wetland habitat and special-status species with the potential to occur in the area.

Construction and design features can be modified to mitigate effects if any are discovered under Restricted Access Alternatives 2 or 3.

Energy and Power Supply

The No Action Alternative would restore pre-February 2003 conditions, and no effects to energy supply or fuel consumption would occur. Neither the Preferred Alternative nor Restricted Access Alternatives 2 and 3 would impact power supply on a regional basis. However, assuming that vehicle miles traveled in Folsom would increase associated with congestion and diversion, an indirect increase in fuel consumption may result. The incremental effect is predicted to be indirect and small (approximately 0.4 percent) under the Preferred Alternative. Under Restricted Access Alternatives 2 and 3, the impact would be greater than the No Action Alternative but less than the Preferred Alternative.

Increases in fuel consumption are indirect impacts of traffic congestion on certain roadways. Therefore, traffic mitigation that improves traffic flow would also reduce the fuel consumption impact. No other mitigation specific to fuel consumption was identified.

Recreation

No immediate or direct impacts to recreation would result from reopening Folsom Dam Road under the No Action Alternative. Local recreation users would be inconvenienced under the Preferred Alternative. However, statistical records indicate that, on a regionwide basis, there would be no change to the use of recreational facilities in the area. It is possible that pressure could increase on existing trails and day use facilities under the Preferred Alternative, although no data are available to demonstrate such a trend. With Folsom Dam Road closed on weekends, Restricted Access Alternatives 2 and 3 would have the same access effects as the Preferred Alternative because most of the recreation activity occurs on weekends.

Mitigation to reduce inconvenience to local recreationists could include building additional facilities on either side of the lake to accommodate the types of recreation in greatest demand, including water-related activities such as boating and swimming. However, such mitigation may not be sustainable given that continued growth would likely fuel further congestion.

Cultural Resources

The No Action Alternative would not have any immediate or direct impact on cultural resources. Similarly, the Preferred Alternative would not affect cultural resources. Restricted Access Alternatives 2 and 3 are not expected to affect cultural resources either; however, because new construction would be required under these alternatives, the risk that unknown or unidentified cultural resources may be affected is greater than with the No Action Alternative.

No mitigation is necessary for the No Action Alternative and Preferred Alternative. Prior to the construction of inspection facilities under Restricted Access Alternatives 2 and 3, detailed cultural resources studies would be undertaken of the area of potential effect. Appropriate treatment measures would be developed and implemented should any cultural resources be discovered.

Public Services and Facilities

Under the No Action Alternative, public access to Folsom Dam Road would be restored. Access to public services and facilities would be restored to pre-February 2003 conditions, with the possible addition of some traffic attributed to citywide growth. Under the Preferred Alternative, emergency access on Folsom Dam Road is allowed. According to city officials, however, the emergency response time may be adversely affected under this alternative.

Traffic patterns are diverted under Preferred Alternative conditions; consequently, response times depend on the destination and vary greatly on a case-by-case basis. Access to other public services and facilities may be hampered by traffic congestion on nearby streets under the Preferred Alternative, but as stated in the Transportation discussion above, factors other than road closure also contribute to delays.

Under Restricted Access Alternatives 2 and 3, impacts are generally similar to those for the Preferred Alternative. Emergency response times would vary based on route traveled and time of day. Access to schools and community services, which may occur during peak commute hours, may benefit slightly under these alternatives.

Impacts to public services and facilities are closely tied to traffic impacts. Therefore, implementing traffic mitigation measures would mitigate some of the impacts associated with the action alternatives.

Other Resource Areas

The impact analysis summarized above represents the resource areas likely to be affected by the Folsom Dam Road Access Restriction alternatives. Input from scoping was also used to define the resource areas addressed. No potential adverse effects were foreseen or identified for land use, geology and seismic hazards, visual resources, or hazardous materials. As described in Section 3.11, land use designations would not be changed; geologic conditions would not be altered; hazardous materials would not be impacted; and although congestion increases may result, the visual character of roadways would not change from a No Action scenario.

REQUIRED PERMITS AND APPROVALS

No resource or regulatory agency permits would be required for either maintaining the road closure or reopening the road to the conditions in place prior to its closure in February 2003. Restricted Access Alternatives 2 and 3 would require construction or installation of additional security and traffic management measures. If implemented, those measures may require other regulatory approvals or permits, which would have to be obtained following the Record of Decision on this EIS.

AREAS OF CONTROVERSY

Areas of controversy primarily include changes in traffic congestion, traffic detours (from pre-road closure conditions), potential effects on economic conditions, and the potential for elevated risk of dam failure. Public controversy exists over why this particular road was closed and whether the concerns about safety and the risks of the road remaining open are warranted.

NEXT STEPS IN THE ENVIRONMENTAL PROCESS

Opportunities for public review and input are an essential element of the NEPA review process. This Public Draft EIS will be available for review for a period of 45 days. During that period, public hearings will be held to present the findings of this document and to receive public comments. Once the public comment period ends, comments will be incorporated into the EIS and a Final EIS will be prepared. This process will culminate in a Record of Decision, which will be issued at the conclusion of the NEPA review process. A long-term decision on the proposed action will be made at that time.

**Table ES-2
Summary of Impacts and Mitigation Measures by Alternative**

TRANSPORTATION / TRAFFIC				
Study Area	No Action Alternative	Preferred Alternative	Net Effect ¹	
			Restricted Access Alternative 2	Restricted Access Alternative 3
Impact: Reduction in Level of Service² (LOS) at Folsom-Auburn Rd. between Folsom Dam Rd. and Inwood Rd. for 2005 only.	LOS of D on roadway segment already functioning below City of Folsom criterion of C.	Declines from LOS D to F for study year 2005.	No difference with respect to No Action Alternative.	Declines from LOS D to E for study year 2005.
Mitigation:	Not applicable. ³	No site-specific mitigation improvement identified/available. ⁴	Not applicable.	No site-specific mitigation improvement identified/available.
Impact: Reduction in LOS at Folsom-Auburn Rd. between Oak Ave. Parkway and Greenback Lane for 2005 only.	LOS of D on roadway segment already functioning below City of Folsom criterion of C.	Declines from D to F for study year 2005. No effect in 2013 due to traffic growth unrelated to the proposed action.	Same as Preferred Alternative: declines from D to F for 2005 and has no incremental effect in 2013 due to traffic growth.	Same as Preferred Alternative: declines from D to F for 2005 and has no incremental effect in 2013 due to traffic growth.
Mitigation:	Not applicable.	No site-specific mitigation improvement identified/available.	No site-specific mitigation improvement identified/available.	No site-specific mitigation improvement identified/available.

¹ Net effect: Difference in effect between the applicable action alternative and the No Action Alternative.

² LOS (Level of Service): LOS is a relative measure of traffic flow, with LOS A representing the least congestion and LOS F representing the most congestion.

³ Not applicable: If the alternative does not cause an effect with respect to the No Action Alternative, then mitigation is defined as not applicable to that alternative (No Action is the base condition against which these impacts are determined).

⁴ No site-specific improvements to the subject intersection have been identified that could be completed without substantial reconstruction of the intersection or addition of structures. For all affected locations, measures to reduce trip generation through ride sharing or transit use would improve conditions but would have to be implemented on a regional or citywide basis.

Table ES-2, continued

TRANSPORTATION / TRAFFIC, continued				
Study Area	No Action Alternative	Preferred Alternative	Net Effect	
			Restricted Access Alternative 2	Restricted Access Alternative 3
Impact: Reduction in LOS at Natoma St. between Folsom Blvd. and Sibley St. for 2005 only.	LOS of D on roadway segment already functioning below City of Folsom criterion of C.	Declines from LOS D to F.	Same as Preferred Alternative: declines from LOS D to F.	Same as Preferred Alternative: declines from LOS D to F.
Mitigation:	Not applicable.	No site-specific mitigation improvement identified/available.	No site-specific mitigation improvement identified/available.	No site-specific mitigation improvement identified/available.
Impact: Reduction in LOS at East Natoma St. between Cimmaron Circle and Folsom Dam Rd. for 2005 only.	LOS of D (2005) on roadway segment already functioning below City of Folsom criterion of C.	Declines from LOS D to F.	Same as Preferred Alternative: declines from LOS D to F.	Same as Preferred Alternative: declines from LOS D to F.
Mitigation:	Not applicable.	No site-specific mitigation improvement identified/available.	No site-specific mitigation improvement identified/available.	No site-specific mitigation improvement identified/available.

Table ES-2, continued

TRANSPORTATION / TRAFFIC, continued				
Study Area	No Action Alternative	Preferred Alternative	Net Effect	
			Restricted Access Alternative 2	Restricted Access Alternative 3
Impact: Reduction in LOS at intersection of Folsom-Auburn Rd./Oak Ave. Parkway.	LOS of E (AM peak hour) and LOS D (PM peak hour) at intersection already functioning below City of Folsom criterion of C.	Increase in traffic. Operations remain at LOS E for the AM peak hour and decline from LOS D to LOS E in the PM peak hour.	Same as Preferred Alternative, with an increase in traffic. Operations remain at LOS E for the AM peak hour and decline from LOS D to LOS E in the PM peak hour.	Same as Preferred Alternative, with an increase in traffic. Operations remain at LOS E for the AM peak hour and decline from LOS D to LOS E in the PM peak hour.
Mitigation:	Not applicable.	The addition of an eastbound right-turn lane would improve the operations at this intersection.	The addition of an eastbound right-turn lane would improve the operations at this intersection.	The addition of an eastbound right-turn lane would improve the operations at this intersection.
Impact: Reduction in LOS at intersection of Folsom Blvd./Natoma St.	Operates at LOS C during AM peak hour and LOS D during PM peak hour.	Reduction in LOS from C to D during AM peak hour. LOS remains at D for PM peak hour as in the No Action Alternative.	No change from No Action Alternative.	Same as Preferred Alternative, with a reduction in LOS from C to D in AM peak hour and no change from No Action Alternative in PM peak hour.
Mitigation:	Not applicable.	The addition of a third southbound through-lane would improve the operations at this intersection.	Not applicable.	The addition of a third southbound through-lane would improve the operations at this intersection.

Table ES-2, continued

TRANSPORTATION / TRAFFIC, continued				
Study Area	No Action Alternative	Preferred Alternative	Net Effect	
			Restricted Access Alternative 2	Restricted Access Alternative 3
Impact: Risk for more accidents as a result of an increase in the number of vehicles on roadways.	The number of vehicles on roadways would continue to increase at the rate of expected citywide growth.	The closure of Folsom Dam Road contributes to congestion on certain roadways. According to data provided by the City of Folsom, an increase in accidents has been reported since the road closure.	Controlled access on Folsom Dam Road may reduce congestion on some roadways compared to the Preferred Alternative, but more cars would still be on nearby roads than with the No Action Alternative.	Same as Restricted Access Alternative 2; there would be more cars on nearby roadways than under the No Action Alternative. More cars on roadways may be associated with a greater risk for accidents.
Mitigation:	Not applicable.	No feasible mitigation identified.	No feasible mitigation identified.	No feasible mitigation identified.
Impact: Risk for potential dam failure could result in loss of use of transportation infrastructure, circulation, and emergency access in Folsom and greater Sacramento County.	Unacceptable level of risk of structural failure and loss of transportation infrastructure.	Risk of event is minimized to extent feasible with respect to vehicular access to the dam.	Controlled access with inspections reduces but does not minimize risks with respect to the No Action Alternative.	Controlled access with inspections reduces but does not minimize risks with respect to the No Action Alternative and Restricted Access Alternative 2.
Mitigation:	Mitigation would consist of selection of one of the other alternatives to maintain security and safety of the dam. No other feasible mitigation ⁵ could be identified.	Not applicable.	Not applicable.	Not applicable.

⁵ No feasible mitigation: Mitigation was considered but not found to be feasible because it could not reasonably or practically reduce the net adverse effect. Therefore, mitigation is not recommended.

Table ES-2, continued

AIR QUALITY				
Study Area	No Action Alternative	Preferred Alternative	Net Effect	
			Restricted Access Alternative 2	Restricted Access Alternative 3
Impact: Change/diversion in vehicle traffic will increase miles traveled and vehicle-related air pollutant emissions	No change in existing levels of traffic-related pollutant emission rates.	Increase is within State and Federal thresholds and would not result in an exceedance of any air quality standards.	Same as Preferred Alternative. No exceedance of air quality standards would result.	Same as Preferred Alternative. No exceedance of air quality standards would result.
Mitigation:	Not applicable.	Not applicable.	Not applicable.	Not applicable.
Impact: Risk for potential dam failure could result in a range of effects from actual emissions reductions due to lack of mobility from road closures to increases in emissions from new inefficiencies. The magnitude and intensity may vary by location.	Risk of changes to air quality, at least on a temporary basis.	Risk of dam failure is minimized to extent feasible with respect to vehicular access to the dam.	Controlled access with inspections reduces but does not minimize risk with respect to the No Action Alternative.	Controlled access with inspections reduces but does not minimize risk with respect to the No Action Alternative and Restricted Access Alternative 2.
Mitigation:	Mitigation would consist of selection of one of the other alternatives to maintain security and safety of the dam. No other feasible mitigation could be identified.	Not applicable.	Not applicable.	Not applicable.

Table ES-2, continued

NOISE				
Study Area	No Action Alternative	Preferred Alternative	Net Effect	
			Restricted Access Alternative 2	Restricted Access Alternative 3
<p>Impact: Traffic noise levels are predicted to increase by approximately 2 dBA at all study locations except three. An increase of less than 2 dBA is considered imperceptible.</p>	<p>Existing and future levels on nearly all study roadways except portions of Natoma Street between Folsom Blvd. and Sibley St. are over 65 dBA and exceed local and Federal noise thresholds and abatement criteria.</p>	<p>Three locations may potentially experience an increase of up to 2–3 dBA:</p> <ul style="list-style-type: none"> Natoma St. between Folsom Blvd. and Sibley St. E. Natoma St. between Cimarron Circle and Folsom Dam Rd. Folsom-Auburn Rd. between Folsom Dam Rd. and Inwood Rd. 	<p>Same as Preferred Alternative. An increase of up to 2–3 dBA is anticipated at three locations.</p>	<p>Same as Preferred Alternative. An increase of up to 2–3 dBA is anticipated at three locations.</p>
<p>Mitigation:</p>	<p>Not applicable.</p>	<p>No feasible noise mitigation (see Section 3.3). Traffic mitigation may improve conditions, thereby reducing noise impacts.</p>	<p>No feasible noise mitigation (see Section 3.3). Traffic mitigation may improve conditions, thereby reducing noise impacts.</p>	<p>No feasible noise mitigation (see Section 3.3). Traffic mitigation may improve conditions, thereby reducing noise impacts.</p>

Table ES-2, continued

NOISE, continued				
Study Area	No Action Alternative	Preferred Alternative	Net Effect	
			Restricted Access Alternative 2	Restricted Access Alternative 3
Impact: Risk for potential dam failure could result in a range of effects from actual noise reductions due to lack of mobility from road closures to increases in noise levels. The magnitude and intensity may vary on a site-by-site basis.	Risk of changes to air noise, at least on a temporary basis.	Risk of dam failure is minimized to extent feasible with respect to vehicular access to the dam.	Controlled access with inspections reduces but does not minimize risks with respect to the No Action Alternative.	Controlled access with inspections reduces but does not minimize risks with respect to the No Action Alternative and Restricted Access Alternative 2.
Mitigation:	Mitigation would consist of selection of one of the other alternatives to maintain security and safety of the dam. No other feasible mitigation could be identified.	Not applicable.	Not applicable.	Not applicable.

Table ES-2, continued

ECONOMIC AND SOCIAL CONDITIONS				
Study Area	No Action Alternative	Preferred Alternative	Net Effect	
			Restricted Access Alternative 2	Restricted Access Alternative 3
Impact: Businesses report a wide range of effects from “none” to “severe.” Individual businesses have reported access and transportation induced declines in sales/revenues.	No loss of business revenues with respect to access to Folsom Dam Road. Competition, industry demand, growth patterns, and other dynamic economic factors may contribute to business effects.	Declines in direct output, employment, and income may result. Economic factors, including road closure, may contribute to an estimated maximum of 21 percent among the 177 businesses located in the immediate vicinity of streets most directly affected by closure.	Same as Preferred Alternative, though to a smaller degree. Restricted access would be available. Some marginal economic benefit expected with respect to Preferred Alternative. However, because the road would remain closed during nonpeak and weekend hours, a net loss of revenues relative to the No Action Alternative would still occur.	Same as Preferred Alternative, though to a smaller degree. Restricted access would be available. Some marginal economic benefit expected with respect to Preferred Alternative. However, because the road would remain closed during nonpeak and weekend hours, a net loss of revenues relative to the No Action Alternative would still occur.
Mitigation:	Not applicable.	Reclamation has no legal obligation or authorization to provide mitigation for impacts associated with the closure of a private maintenance road. Economic effects vary by location and by different causes. Claims for mitigation or compensation, if made, would have to be evaluated based on individual review of direct and demonstrable effects.	Same as Preferred Alternative; any mitigation would have to be determined on a case-by-case basis if direct and demonstrable impacts can be established.	Same as Preferred Alternative; any mitigation would have to be determined on a case-by-case basis if direct and demonstrable impacts can be established.

Table ES-2, continued

ECONOMIC AND SOCIAL CONDITIONS, continued				
Study Area	No Action Alternative	Preferred Alternative	Net Effect	
			Restricted Access Alternative 2	Restricted Access Alternative 3
Impact: Risk for potential dam failure could result in billions of dollars of losses. Agriculture, recreation, business revenues, infrastructure, and personal property would be affected.	Unacceptable level of risk. Losses may be temporary or sustained, and would vary within the region.	Risk of dam failure is minimized to extent feasible with respect to vehicular access to the dam.	Controlled access with inspections reduces but does not minimize risks with respect to the No Action Alternative.	Controlled access with inspections reduces but does not minimize risks with respect to the No Action Alternative and Restricted Access Alternative 2.
Mitigation:	Mitigation would consist of selection of one of the other alternatives to maintain security and safety of the dam. No other feasible mitigation could be identified.	Not applicable.	Not applicable.	Not applicable.

Table ES-2, continued

WATER RESOURCES AND SUPPLY				
Study Area	No Action Alternative	Preferred Alternative	Net Effect	
			Restricted Access Alternative 2	Restricted Access Alternative 3
Impact: Indirect impacts to water quality from an increase in surface water runoff due to traffic changes.	No change in surface water runoff, either in terms of quality or quantity.	Small, indirect reduction in water quality may result under the assumption that more vehicle miles would be traveled in Folsom under the Preferred Alternative. An increase in vehicle miles traveled could result in an increase of air pollutants and, in turn, a minor increase in surface water runoff pollutants from roads.	Same as Preferred Alternative; an indirect reduction in water quality may result. Under this alternative, an incremental adverse impact may result from the construction of inspection facilities.	Same as Preferred Alternative; an indirect reduction in water quality may result. Under this alternative, an incremental adverse impact may result from the construction of inspection facilities. However, because fewer cars would cross Folsom Dam Road under this alternative, fewer inspection stations would be needed, resulting in less impact relative to Restricted Access Alternative 2.
Mitigation:	Not applicable.	No feasible mitigation specific to water resources was identified. Traffic mitigation may improve traffic flow, reducing impacts to water quality.	Same as Preferred Alternative. In addition, employ Best Management Practices for erosion control and waste handling during construction.	Same as Preferred Alternative. In addition, employ Best Management Practices for erosion control and waste handling during construction.

Table ES-2, continued

WATER RESOURCES AND SUPPLY, continued				
Study Area	No Action Alternative	Preferred Alternative	Net Effect	
			Restricted Access Alternative 2	Restricted Access Alternative 3
Impact: Risk for potential dam failure could result in widespread impacts to water districts and water-related features in the area.	Widespread impacts to water districts and people would result if a dam failure occurs. This alternative would not be consistent with Executive Order 11988 on Floodplain Management.	Risk of dam failure is minimized to extent feasible with respect to vehicular access to the dam.	Controlled access with inspections reduces but does not minimize risks with respect to the No Action Alternative.	Controlled access with inspections reduces but does not minimize risks with respect to the No Action Alternative and Restricted Access Alternative 2.
Mitigation:	Mitigation would consist of selection of one of the other alternatives to maintain security and safety of the dam. No other feasible mitigation could be identified.	Not applicable.	Not applicable.	Not applicable.

Table ES-2, continued

BIOLOGICAL RESOURCES				
		Net Effect		
Study Area	No Action Alternative	Preferred Alternative	Restricted Access Alternative 2	Restricted Access Alternative 3
<i>Impact:</i> Potential for impacts to habitat or species from construction of inspection facilities or risk of inundation.	No physical changes to habitat or species would occur. Traffic patterns would be restored to pre-February 2003 levels.	No incremental effect from the No Action Alternative.	Habitats have been previously disturbed in areas where construction of inspection facilities could occur. Restricted Access Alternative 2 would not affect listed species, wetlands or other sensitive habitats.	Similar to Restricted Access Alternative 2, although construction footprint may be slightly smaller because fewer inspection stations would be required.
<i>Mitigation:</i>	Not applicable.	Not applicable.	Focused surveys by a qualified biologist would be conducted prior to construction. Design would have to avoid habitat impacts, as necessary.	Focused surveys by a qualified biologist would be conducted prior to construction. Design would have to avoid habitat impacts, as necessary.

Table ES-2, continued

BIOLOGICAL RESOURCES, continued				
Study Area	No Action Alternative	Preferred Alternative	Net Effect	
			Restricted Access Alternative 2	Restricted Access Alternative 3
<i>Impact:</i> Risk for potential dam failure could result in the loss of habitats of sensitive and listed species.	Habitats of sensitive and listed species and other aquatic and terrestrial wildlife would be impacted. Woodland, mixed forest and riparian vegetation may be lost. Species that utilize these habitats would be directly and immediately impacted. Over time, these habitats would be restored.	Risk of dam failure is minimized to extent feasible with respect to vehicular access to the dam.	Controlled access with inspections reduces but does not minimize risks with respect to the No Action Alternative.	Controlled access with inspections reduces but does not minimize risks with respect to the No Action Alternative and Restricted Access Alternative 2.
<i>Mitigation:</i>	Mitigation would consist of selection of one of the other alternatives to maintain security and safety of the dam. No other feasible mitigation could be identified.	Not applicable.	Not applicable.	Not applicable.

Table ES-2, continued

ENERGY AND POWER SUPPLY				
Study Area	No Action Alternative	Preferred Alternative	Net Effect	
			Restricted Access Alternative 2	Restricted Access Alternative 3
Impact: An indirect impact to fuel consumption may result from an increase in vehicle miles traveled in Folsom.	No effects to energy supply or fuel consumption would occur.	Energy supply would remain unchanged on a regional basis from the No Action Alternative. However, assuming an increase in vehicle miles traveled in Folsom relative to the No Action Alternative, an increase of 0.4 percent in fuel consumption may occur.	Same as Preferred Alternative. Energy supply would remain unchanged and there would be a slight increase in fuel consumption due to an increase in vehicle miles traveled in Folsom.	Same as Preferred Alternative. Energy supply would remain unchanged and there would be a slight increase in fuel consumption due to an increase in vehicle miles traveled in Folsom.
Mitigation:	Not applicable.	No feasible mitigation identified specific to energy consumption. An improvement in traffic would reduce the impact.	No feasible mitigation identified. An improvement in traffic would reduce the impact.	No feasible mitigation identified. An improvement in traffic would reduce the impact.
Impact: Risk for potential dam failure could result in temporary energy and power losses.	Temporary effects on power supply would likely result.	Risk of dam failure is minimized to extent feasible with respect to vehicular access to the dam.	Controlled access with inspections reduces but does not minimize risks with respect to the No Action Alternative.	Controlled access with inspections reduces but does not minimize risks with respect to the No Action Alternative and Restricted Access Alternative 2.
Mitigation:	Mitigation would consist of selection of one of the other alternatives to maintain security and safety of the dam. No other feasible mitigation could be identified.	Not applicable.	Not applicable.	Not applicable.

Table ES-2, continued

RECREATION				
Study Area	No Action Alternative	Preferred Alternative	Net Effect	
			Restricted Access Alternative 2	Restricted Access Alternative 3
Impact: Inconvenience to local recreation users who would encounter delays or be rerouted in order to access shoreline and water recreation resources.	No impacts to local or regional recreation users would occur.	Access to some locations may be less convenient. Overall use records have not substantially changed since closure.	Same as Preferred Alternative, although access around Folsom Lake would be slightly better.	Same as Preferred Alternative, although access around Folsom Lake would be slightly better.
Mitigation:	Not applicable.	No feasible mitigation identified (see Section 3.8.3).	No feasible mitigation identified (see Section 3.8.3).	No feasible mitigation identified (see Section 3.8.3).
Impact: Risk for potential dam failure could result in effects to reservoir-based activities and associated land-based recreation.	If dam failure occurs, local residents and visitors would be affected by the impacts to reservoir-based recreational resources.	Risk of dam failure is minimized to extent feasible with respect to vehicular access to the dam.	Controlled access with inspections reduces but does not minimize risks with respect to the No Action Alternative.	Controlled access with inspections reduces but does not minimize risks with respect to the No Action Alternative and Restricted Access Alternative 2.
Mitigation:	Mitigation would consist of selection of one of the other alternatives to maintain security and safety of the dam. No other feasible mitigation could be identified.	Not applicable.	Not applicable.	Not applicable.

Table ES-2, continued

CULTURAL RESOURCES				
Study Area	No Action Alternative	Preferred Alternative	Net Effect	
			Restricted Access Alternative 2	Restricted Access Alternative 3
Impact: Potential for disturbance to known or unknown cultural resource sites	No cultural resources would be affected.	No change would occur from the No Action Alternative.	Potential exists for discovery of undocumented buried cultural resources during construction of vehicle inspection facilities.	Same as Restricted Access Alternative 2. Potential exists for discovery of undocumented buried cultural resources during construction of vehicle inspection facilities.
Mitigation:	Not applicable.	Not applicable.	Undertake detailed cultural resources studies in area of potential effect as necessary. Consult with federally recognized Native American tribes. Develop appropriate treatment measures should cultural resources be discovered.	Same as Alternative 2. Cultural resources studies would be undertaken for the area of potential effect.
Impact: Risk for potential dam failure could result in erosion of soils and effects to historic structures.	If a dam failure were to occur, there would be a potential for disturbance or adverse effects to archaeological and historic resources.	There would be no impact to cultural resources.	Risk to security of dam reduced but not avoided; some indirect risks to cultural resources remain.	Risk to security of dam reduced but not avoided; some indirect risks to cultural resources remain.
Mitigation:	Not applicable.	Not applicable.	Not applicable.	Not applicable.

Table ES-2, continued

PUBLIC SERVICES AND FACILITIES				
Study Area	No Action Alternative	Preferred Alternative	Net Effect	
			Restricted Access Alternative 2	Restricted Access Alternative 3
Impact: Indirect impacts to public services and facilities could result from changes in traffic patterns.	No impacts to public services or facilities would occur.	Folsom Dam Road remains open to emergency response access. Depending on specific routes and destinations, inconveniences to local residents and emergency response personnel may result from changes to traffic patterns.	Same as Preferred Alternative. Emergency response access remains open, but inconveniences due to traffic changes remain. The impact would be relatively less than the Preferred Alternative because Folsom Dam Road would be accessible during peak commute hours.	Same as Preferred Alternative. Emergency response access remains open, but inconveniences due to traffic changes remain. The impact would be relatively less than the Preferred Alternative because Folsom Dam Road would be accessible during peak commute hours. ² .
Mitigation:	Not applicable.	No feasible mitigation identified specific to public services or facilities. An improvement in traffic would reduce the impact.	No feasible mitigation identified specific to public services or facilities. An improvement in traffic would reduce the impact.	No feasible mitigation identified specific to public services or facilities. An improvement in traffic would reduce the impact.

Table ES-2, continued

PUBLIC SERVICES AND FACILITIES, continued				
Study Area	No Action Alternative	Preferred Alternative	Net Effect	
			Restricted Access Alternative 2	Restricted Access Alternative 3
Impact: Risk for potential dam failure could result in impacts to public facilities. Public services, including emergency access, may incur temporary effects.	Unacceptable level of risk. Losses may be temporary or sustained and would vary at different locations.	Risk of dam failure is minimized to extent feasible with respect to vehicular access to the dam.	Controlled access with inspections reduces but does not minimize risks with respect to the No Action Alternative.	Controlled access with inspections reduces but does not minimize risks with respect to the No Action Alternative and Restricted Access Alternative 2.
Mitigation:	Mitigation would consist of selection of one of the other alternatives to maintain security and safety of the dam. No other feasible mitigation could be identified.	Not applicable.	Not applicable.	Not applicable.

This Environmental Impact Statement (EIS) addresses the U.S. Department of the Interior, Bureau of Reclamation's (Reclamation's) proposed action and alternatives for vehicular access restriction along Folsom Dam Road in the City of Folsom, California. Folsom is approximately 25 miles east of Sacramento in the Sierra Nevada foothills, west of Placerville (Figure 1-1).

1.1 PURPOSE AND NEED

The **purpose and need** for this action is to:

- Control access to Folsom Dam, including all traffic on Folsom Dam Road
- Minimize the security risks and maximize the safety of Folsom Dam and of the entire Sacramento metropolitan area downstream of the dam

1.2 BACKGROUND

1.2.1 Construction and Design of Folsom Dam and Folsom Dam Road

In 1944, Congress authorized the U.S. Army Corps of Engineers (USACE) to construct Folsom Reservoir as a flood control structure on the American River upstream of Sacramento. The Reclamation Act of October 14, 1949, transferred Folsom Dam and Reservoir from the USACE to Reclamation under the supervision of the Secretary of the Interior, to be integrated with the Central Valley Project and operated as a multipurpose project for flood control, irrigation, hydropower generation, and water supply. The dam was designed to handle a 120-year storm. Folsom Dam and Reservoir was completed in 1956; however, its function as a flood control facility was proven even before its completion during a record storm event that threatened Sacramento in 1956.

When the dam was built, the USACE constructed a maintenance road atop the crest of the dam. This road eventually became known as Folsom Dam Road. The two-lane, undivided road is approximately 2.3 miles long and connects Folsom-Auburn Road on the north side of the American River with East Natoma Street on the south side (Figure 1-2). About 1,400 feet of the road crosses the concrete monoliths of the main dam structure and spillway. Approximately 4,000 feet of the road lies on top of or adjacent to the earth embankment section of the dam. The land on either side of the dam is within Folsom city limits.

Folsom Dam Road provides direct access to the industrial complex at Folsom Dam, which houses Reclamation staff, shops, warehouses, and administrative buildings. The resources at the complex are used to operate and maintain facilities and equipment in support of the dam's core functions. In addition, Reclamation personnel at the complex have areawide responsibilities for land management, environmental monitoring and documentation, repayment of contract administration, recreation program administration, and oversight of operations and maintenance at remote locations. The complex also houses California Department of Parks and Recreation staff and shops and buildings supporting the Folsom State Recreation Area (SRA). Furthermore, Folsom Dam Road provides access to Federal property east of the dam and adjacent to Folsom Prison.

Prior to the construction of Folsom Dam, the USACE consulted with the California Highway Commission regarding the necessity for a public highway crossing over Folsom Dam such that,

under Federal law, the State of California (the State) would be obligated to reimburse the costs incurred by the Federal Government for the design and construction of the road. The California Highway Commission did not find a need for a public highway across the dam. Accordingly, no State route was designated across the dam, and Folsom Dam Road was neither officially certified nor dedicated for use by the general public.

As a result, Folsom Dam Road was built to provide maintenance access to the dam structure. The construction and design features of Folsom Dam Road are considered inadequate for general traffic use. However, growth within the City of Folsom and other surrounding cities and communities has resulted in drivers relying on Folsom Dam Road as a traffic artery. Consequently, Reclamation has expended funds over the years to maintain and repair the road. Neither the State nor any local governments contribute funds for the maintenance and operation of Folsom Dam Road.

1.2.2 Risk and Road Closure

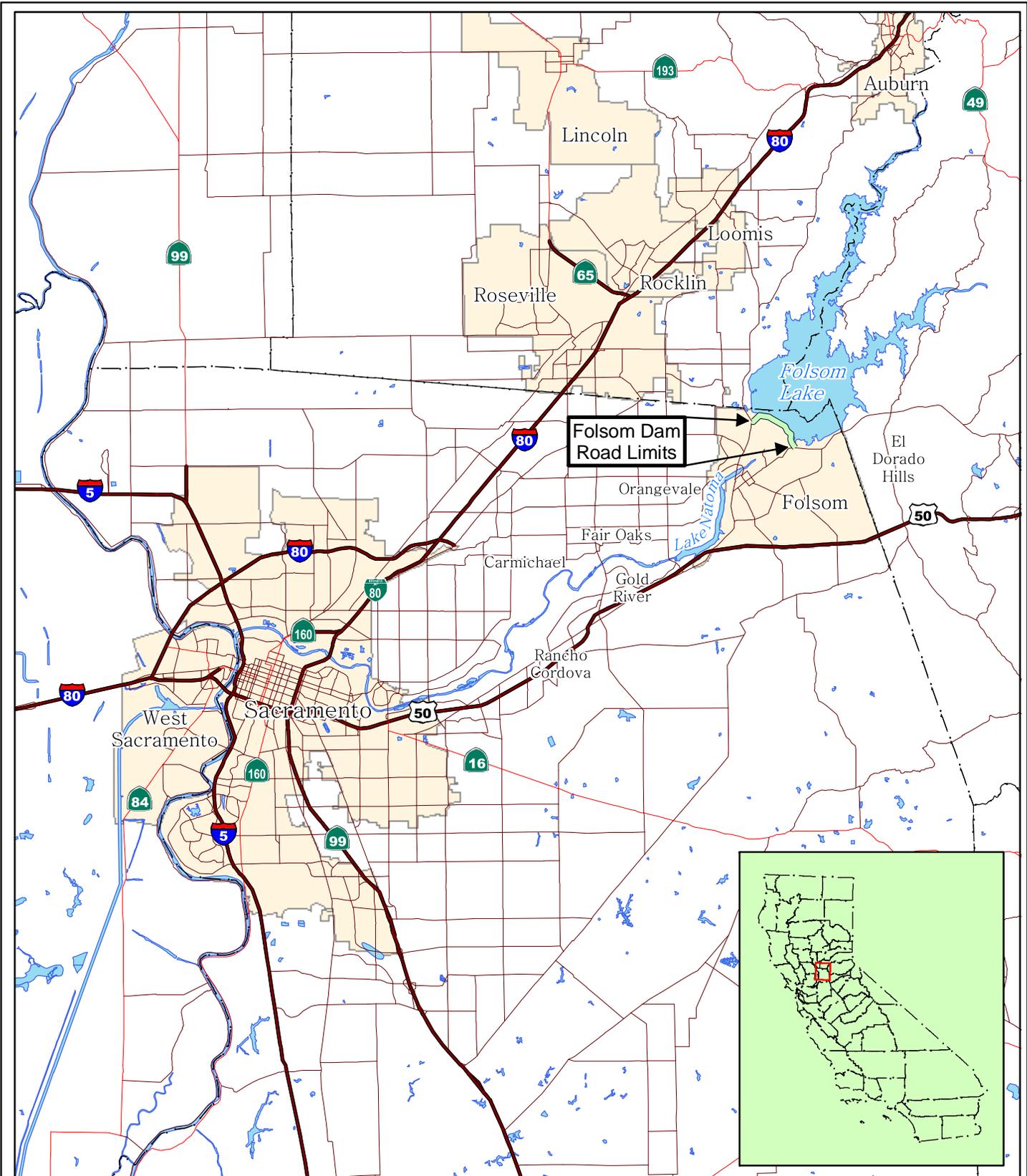
Unlike any other dam of comparable size in the United States, Folsom Dam is located upstream and within close proximity of a densely populated major metropolitan area. Sacramento lies 25 miles west of the dam. Other communities, including Folsom, Orangevale, Fair Oaks, Carmichael, Gold River, El Dorado Hills, and Rancho Cordova, lie immediately downstream of the dam (Figure 1-3). In the event of a dam breach or failure, extensive damage and adverse environmental effects can be expected to result within a short period of time.

As stated above, Folsom Dam Road was designed to provide access for operation and maintenance of the dam. As such, the road has been closed intermittently for dam rehabilitation and maintenance work. In addition, a spillway gate failure at the dam triggered a road closure in 1995 for immediate safety reasons and to allow the spillway to be repaired. Also in 1995, the Oklahoma City bombing caused the Federal Government to re-examine the vulnerability of all of its structures, and Folsom Dam Road was closed as an interim safety measure. In each of these cases, road closure ranged from a few days to several weeks.

Various security assessments were conducted at Folsom Dam, and Reclamation identified the risks associated with open public access to the dam structure. After September 11, 2001, however, Reclamation took additional measures to ensure the security of its facilities. Public access on Folsom Dam Road was limited to cars and pickup trucks during daylight hours. Commercial vehicles, pedestrians, and bicycles were not permitted on the road, although the restriction on commercial vehicles was not actively enforced. Meanwhile, Reclamation began formulating a comprehensive long-term security response plan.

As part of the comprehensive security plan, Reclamation contracted with security experts at the Defense Threat Reduction Agency, Lawrence Livermore National Laboratories, and other private security firms to assess critical facilities including Folsom Dam for risk, vulnerability, and security. The independent security review concluded that uncontrolled access to the top of the dam, wing dams, and dikes constituted a clear and severe risk to the facility and to downstream communities, including Sacramento.

Reclamation analyzed recommendations received from the security assessment and decided to enhance security procedures and fortify facilities based on the associated risks. On February 28, 2003, Folsom Dam Road was closed pending a long-term decision regarding public access to the



Legend

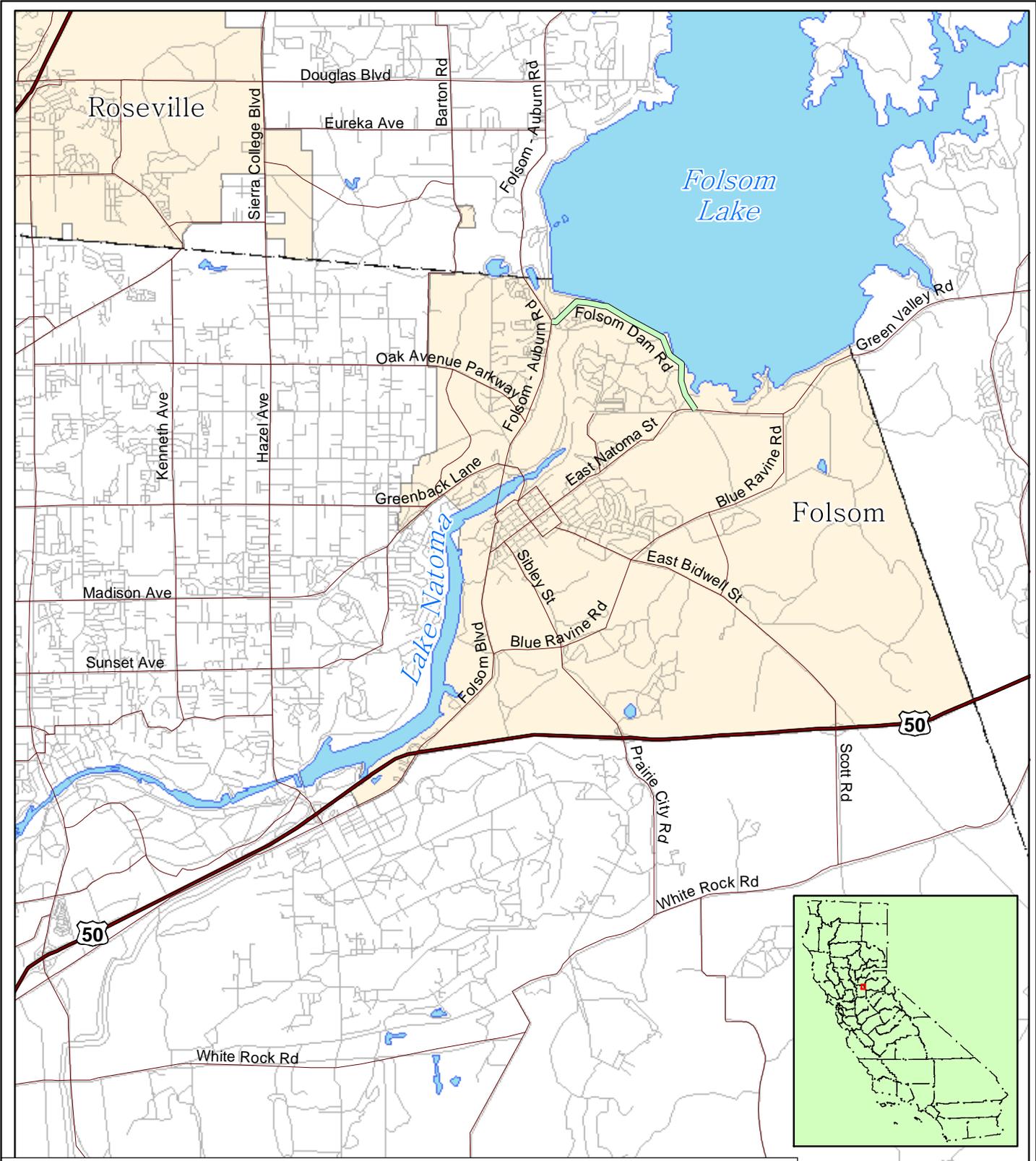
- Freeway or Primary Highway
- Secondary and connecting road
- Primary road
- Local road
- Road, major and minor categories unknown
- County Boundaries
- Water Bodies
- City Boundaries



Folsom Dam
Road Restriction EIS
18600807

Regional Vicinity
Map

Figure
1-1



Legend

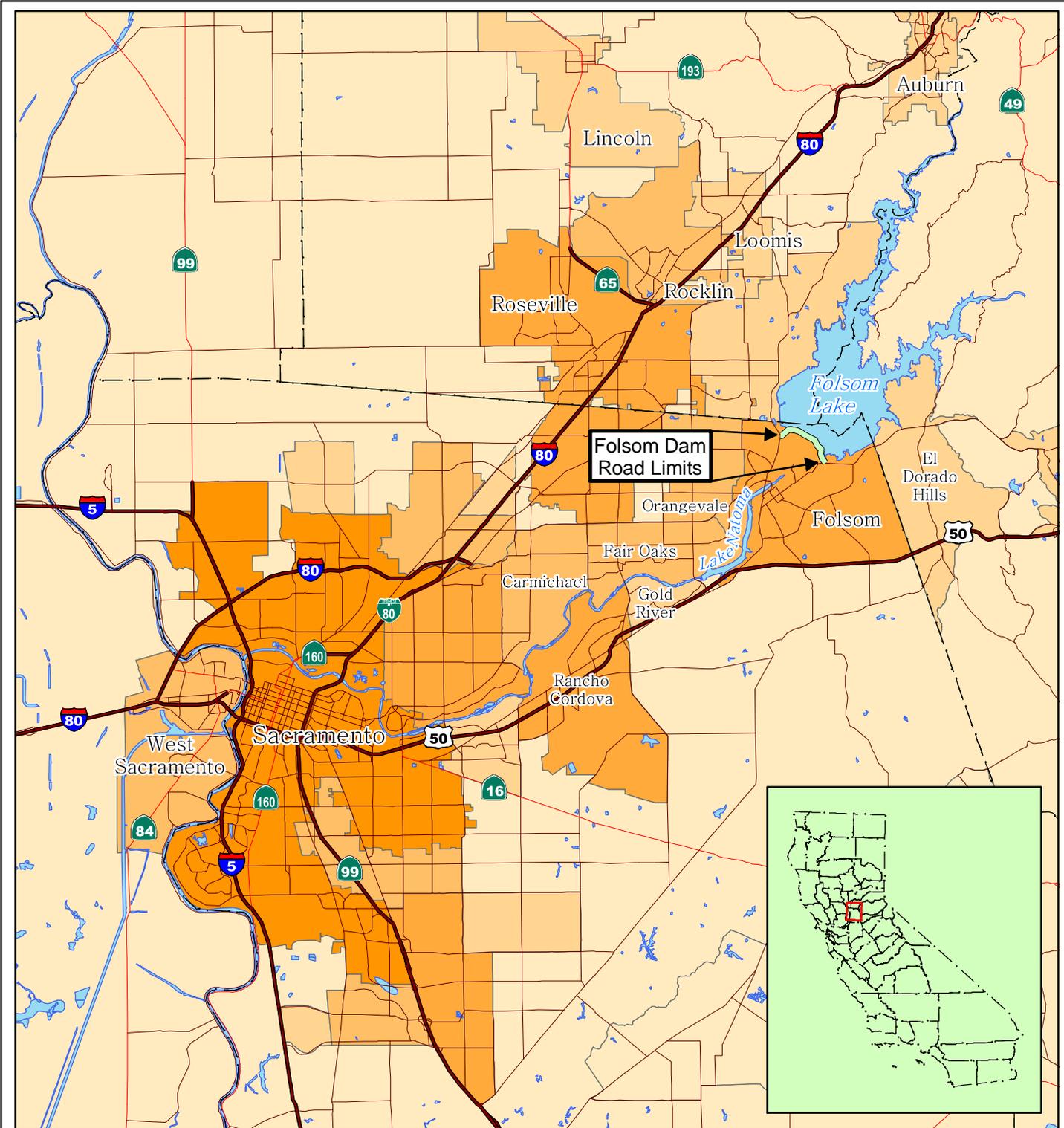
- | | | |
|--|---|---|
|  Freeway or Primary Highway |  Secondary and connecting road |  Water Bodies |
|  Primary road |  Local road |  County Boundaries |
| |  Road |  City Boundaries |



Folsom Dam
Road Restriction EIS
18600807

Local Vicinity Map

Figure
1-2



Legend

- | | | | |
|----------------------------|--|-------------------|-------------------------|
| Freeway or Primary Highway | Secondary and connecting road | County Boundaries | Total Population |
| Primary road | Local road | Water Bodies | 0 - 5,000 |
| | Road, major and minor categories unknown | | 5,001 - 25,000 |
| | | | 25,001 - 50,000 |
| | | | 50,001 - 100,000 |
| | | | 100,001 + |



Folsom Dam
Road Restriction EIS
18600807

Regional Population
Map

Figure
1-3

road. All motorized access to the dikes, wing dams, and Mormon Island Auxiliary Dam was disallowed. The indefinite closure of the road and associated dikes and wing dams was enacted by a Closure Order.

In addition to the short-term security measures, Reclamation continues to develop a comprehensive, long-term security plan. Key elements of the plan include a long-term solution for the future of vehicular access on Folsom Dam Road. That is the subject of this EIS. Separately, Reclamation is identifying other measures and policies that will enhance security and fortify facilities. Such measures may include fencing, screening, increasing the number of security personnel, and further limiting access to facilities.

1.2.3 Public Use of Folsom Dam Road Prior to Closure

Folsom Lake, Folsom Dam, and Lake Natoma form a substantial geographic barrier within the community of Folsom. Prior to the Folsom Dam Road closure in 2003, only three roadways crossed these features: Folsom Dam Road, Rainbow Bridge (Riley Street crossing), and the recently completed Lake Natoma Crossing (Folsom Street crossing). Folsom Dam Road provided the most northeasterly of these crossings. It also provided a route drivers could use to avoid downtown Folsom, especially during commute hours.

Significant growth in Folsom as well as in nearby Sierra Foothill communities has been a source of increased vehicular traffic through Folsom, particularly on Folsom Dam Road. The City of Folsom nearly doubled in population, from 29,600 to 57,200, between 1990 and 2001 (SACOG 2002a). Placer County, whose southern communities are in the vicinity of Folsom Dam Road, is the fastest-growing county in the nation, with a growth rate of nearly 48 percent between 1990 and 2001. As residential and commercial growth have hit record highs throughout the area, vehicular traffic in Sacramento, El Dorado, and Placer counties has also increased. Nearly 18,000 vehicles crossed Folsom Dam Road on a daily basis before its closure in February 2003. Increased public use of Folsom Dam Road also requires that Reclamation allocate additional resources to the upkeep and maintenance of the road.

For measurement and planning purposes, traffic flow is evaluated in terms of Level of Service (LOS) ratings. “A” represents the best or free-flow conditions, and “F” represents substantial congestion and delay (Figure 1-4). According to its General Plan (1995), the City of Folsom aims to achieve an LOS of C, which translates to moderate traffic congestion where average vehicle speeds can continue to be near motorists’ desired speed for two- to four-lane roads. Many Folsom roads and intersections operated at levels below LOS C prior to 2003. These include the Rainbow Bridge, the Lake Natoma Crossing, Folsom Boulevard, Folsom-Auburn Road, and Natoma and East Natoma Streets.

1.3 POST-CLOSURE ACTIONS

The indefinite closure of Folsom Dam Road in February 2003 was an immediate response to the security concerns identified as part of the 2002 investigation. In addition, Reclamation began developing a long-term comprehensive security plan to address security needs at various facilities. Preparation of this EIS under the National Environmental Policy Act (NEPA) is part of the process of creating a security plan for Folsom Dam. Actions such as fencing and

screening in the vicinity have been implemented; other security measures relating to dam protection may also be undertaken.

Since the closure of Folsom Dam Road eliminated one of the most direct access routes from the northern portion of Folsom to the southern edge of Orangevale, a number of passenger cars have diverted to longer alternate routes to get around the reservoir and across the American River and Lake Natoma. (Trucks were already not permitted on Folsom Dam Road, although the restriction was not enforced and they continued to use the road.) Traffic that had been using Folsom Dam Road diverted to Rainbow Bridge and the Lake Natoma Crossing. Increased congestion, in terms of decreased levels of service, has occurred on other alternate routes including the following:

- Folsom Boulevard/Folsom-Auburn Road/Riley Street/Greenback Lane intersection
- Folsom Boulevard
- Folsom-Auburn Road
- Local streets within the City of Folsom

When the indefinite decision to close Folsom Dam Road was made in February 2003, Reclamation notified the public and local governments. The City of Folsom opposed the action because of concerns about new traffic patterns that were resulting from the closure, particularly in the city's historic district and adjacent neighborhoods. The City of Folsom recommended that Reclamation reconsider the security threat and identify alternative means of allowing restricted or controlled traffic use on the road. Meanwhile, the city developed and implemented the Folsom Historic District Traffic Calming Program, which closed or limited traffic on selected roadways in the city. Traffic signal timing changes and turn-pocket modifications were also implemented in an attempt to improve traffic flows. While the program received support from residents of streets that experienced increased traffic volumes in the immediate aftermath of the Folsom Dam Road closure, other residents voiced concerns during the scoping process of this EIS that the program has further limited access to businesses in the area.

As a result of some of these actions, a group that includes the City of Folsom, the City of Sacramento, the City of Rancho Cordova, Sacramento County, and the California Highway Patrol is devising and proposing a traffic management plan for Folsom Dam Road that could alternatively meet security requirements.

With the Folsom Dam Road closure and the subsequent changes to roadways in the area, the two intersections at either end of Folsom Dam Road have shown improved operations, as would be expected, due to the substantial reduction of traffic on the intersection legs toward the dam. The operations of the Riley Street/Scott Street, Riley Street/Sutter Street, and Natoma Street/Coloma Street intersections improved after the city implemented its traffic diversion plan. The intersections of Folsom-Auburn Road/Oak Avenue Parkway, Folsom-Auburn Road/Greenback Lane, and Riley Street/East Natoma Street have operated at unacceptable levels during peak periods both with the road closure and the city's traffic calming program.

After the closure and diversions, traffic on Folsom-Auburn Road increased by approximately 8,000 vehicles per day. In addition, the closure contributed to an increase of approximately 9,000

LEVELS OF SERVICE

Representative of Multi-Lane Roadways and Highways

Level of Service	Flow Conditions	Technical Descriptions
A		Highest level of service. Traffic flows freely with little or no restrictions on maneuverability. No delays
B		Traffic flows freely, but drivers have slightly less freedom to maneuver. No delays
C		Density becomes noticeable with ability to maneuver limited by other vehicles. Minimal delays
D		Speed and ability to maneuver is severely restricted by increasing density of vehicles. Minimal delays
E		Unstable traffic flow. Speeds vary greatly and are unpredictable. Minimal delays
F		Traffic flow is unstable, with brief periods of movement followed by forced stops. Significant delays

Source: Modified diagram based on Highway Capacity Manual, LOS Criteria

Folsom Dam Road
Restriction EIS

Diagram of Level of Service (LOS) for
Multi-Lane Roadways

Figure
1-4

vehicles per day over Rainbow Bridge and the Lake Natoma Crossing combined. LOS F operations currently exist on segments of Folsom-Auburn Road, Rainbow Bridge, and Natoma Street.

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2.1 PROCESS USED TO FORMULATE ALTERNATIVES

2.1.1 Identification of Alternatives for Analysis

The identification, consideration, and analysis of reasonable alternatives are key to the National Environmental Policy Act (NEPA) process and important to the environmental evaluation process. Consideration of alternatives leads to a solution that satisfies the stated purpose and need and protects environmental and community resources.

Four alternatives are analyzed as part of this Environmental Impact Statement (EIS): the No Action Alternative; the continued long-term closure of Folsom Dam Road, which is identified as the Preferred Alternative¹, or the alternative that Reclamation currently believes would best fulfill its statutory mission and responsibilities; and two Restricted Access Alternatives that involve partially opening Folsom Dam Road to public use. The No Action Alternative would involve restoring public access on Folsom Dam Road to pre-February 2003 conditions. This alternative serves as a baseline against which the other alternatives are compared. Each of the alternatives considered and analyzed is described in detail below.

2.1.2 Operational Constraints

Any alternative that recommends even partially opening Folsom Dam Road to public use must take into account operational conditions and constraints. As noted in Section 1.2, Folsom Dam Road provides direct access to an industrial complex that houses Reclamation and California Department of Parks and Recreation staff. Personnel located at the complex have local and regional responsibilities. Increasing traffic on Folsom Dam Road as a result of continued growth in the area causes delays and impedes the staff's ability to fulfill their responsibilities in a timely manner. At a minimum, any alternative that reopens Folsom Dam Road for public use must allow for periodic closures of the road so that scheduled dam-related operations and maintenance work can occur without difficulty.

Planning and cost constraints are associated with the partial or complete opening of Folsom Dam Road to public use. Opening the road would reintroduce the risk of liabilities to Reclamation from accidents on the road. It would also place the responsibility of maintaining the road on Reclamation. As the road was not originally designed for public use, road maintenance and repair was not previously anticipated as a recurring cost to Reclamation. Because road repair is a public safety issue when the road is open for public use, its timing and cost can take precedence over dam maintenance activities. Thus, reopening the road can affect the scheduling and budget allocations for dam-related activities. Over the four years preceding the road closure, Reclamation determined that the average annual cost of road maintenance was nearly \$54,000. Assignment of costs would have to be negotiated between the City of Folsom and Reclamation before the road could be reopened.

¹ Under NEPA, the Lead Agency must identify a Preferred Alternative if it believes that an alternative best meets its statutory mission and responsibilities. The Preferred Alternative is not necessarily the environmentally preferable alternative, nor is it the alternative that would necessarily be selected in the Record of Decision.

Reopening Folsom Dam Road to the public would require security measures to be in place to minimize risk to public safety. Under the No Action Alternative, restrictions that existed prior to February 2003 would be reinstated. These would include limits on vehicle size and restrictions on pedestrian and bicycle access. Under Restricted Access Alternatives 2 and 3, these limitations would also apply. Additional security measures would also be put in place to minimize security risks, in accordance with Reclamation’s core mission and responsibility. The number of vehicles able to access Folsom Dam Road would also be controlled under each of the action alternatives.

All alternatives would continue to allow access for emergency response, as necessary. Reclamation has had discussions with the City of Folsom’s fire and police departments to establish appropriate procedures for allowing emergency road access.

2.2 ALTERNATIVES CONSIDERED IN DETAIL

A comparison of alternatives is presented in Table 2-1. No Action is an alternative that is required for evaluation under NEPA. The Preferred Alternative was identified by Reclamation. The two Restricted Access Alternatives were proposed by the City of Folsom. The individual alternatives are described in more detail below.

**Table 2-1
Comparison of Alternatives**

	No Action Alternative	Preferred Alternative	Restricted Access Alternatives	
			Alternative 2	Alternative 3
Days Open¹	7 days/week	None	Monday–Friday	Monday–Friday
Hours Open²	24 hours	None	3-hour peak periods, both AM and PM (e.g. 6–9 AM, 4–7 PM)	2-hour peak periods, both AM and PM (e.g. 6–8 AM, 4–6 PM)
Traffic Directional Flow³	Two-way	None	Two-way	One-way
Vehicle Restrictions⁴	Passenger cars, motorcycles, trucks under 5.75 tons (11,500 pounds) gross weight only	No public access	Passenger cars, motorcycles, and non-commercial pickups only	Passenger cars, motorcycles, and noncommercial pickups only
Desired Hourly Volume⁵	Not restricted	None	Proposed at 1,500 vehicles per hour, both directions (for purposes of analysis, 960 cars per hour in the peak direction was assumed) ⁶	500 vehicles per hour

Table 2-1, concluded

	No Action Alternative	Preferred Alternative	Restricted Access Alternatives	
			Alternative 2	Alternative 3
Screening/ Inspection	Relatively unrestricted access across Folsom Dam Road. Lowest level of screening and security.	No public access. Highest level of security with respect to eliminating vehicle-related threats on Folsom Dam Road.	Folsom Dam Road access by permit only. Permits available through prescreening application. Vehicles must pass through permit checkpoint and be subject to inspection. Alternative provides for denial of access, but uninspected cars can access dam facility.	Same as Restricted Access Alternative 2
Consistency With Purpose and Need	This alternative does not meet the purpose and need.	The Preferred Alternative meets the purpose and need.	Alternative 2 controls access, reduces risks, and increases safety compared to the No Action Alternative. It is consistent with the purpose and need, but does not minimize the risk or maximize safety in comparison to the other action alternatives.	Alternative 3 further reduces risk (compared with Alternative 2 and the No Action Alternative). It is consistent with the purpose and need.

¹ Days open refers to the days of a typical week in which the road would be open to public traffic. Federal holidays are excluded. Reclamation would retain the right to deny access for overriding considerations, which include but are not limited to: elevated Department of Homeland Security threat levels, routine maintenance, construction of flood control improvements, etc.

² Hours open refers to the hours of a typical day in which the road would be open to public traffic. Conditions that pertain to days of operation also apply to hours of operation if necessary.

³ Directional flow refers to the direction of travel permitted during periods in which the road is open to traffic. Under Alternative 3, traffic would flow in the northbound direction only during the morning peak period and in the southbound direction only in the evening peak period.

⁴ Vehicle restrictions refer to the general types of vehicles that would be permitted to travel across the dam. Vehicles that do not match the criteria would be denied access and would need to seek an alternative route. No commercial vehicles, buses, recreational vehicles or towed trailers would be allowed access.

⁵ Hourly volume refers to the desired service level in terms of vehicles per hour. Because of the constraints of required vehicle inspection, the achievable flow of traffic would depend on the rate of inspection assumed and the number of inspection lanes in each direction.

⁶ For purposes of analyzing Restricted Access Alternative 2, a one-way directional split was assumed for the peak traffic flow direction. A rate of 960 vehicles per hour was used for the peak direction flow because with inspection-related traffic delays, processing more than 1,000 vehicles per hour on a single-lane road would be infeasible. If every vehicle were inspected with an average delay of no more than 30 seconds per vehicle, eight inspection stations could achieve 960 vehicles per hour. This one-way directional flow was therefore used to represent a reasonable upper limit to the maximum traffic volume that could be achieved.

2.2.1 No Action Alternative

The No Action Alternative would consist of reopening Folsom Dam Road to provide access at pre-February 2003 levels, prior to the indefinite road closure. No major physical alteration of the road or additional restrictions on traffic flow would be undertaken. Traffic would be allowed on the road 7 days per week, 24 hours per day. The pre-February 2003 restrictions, including “no stopping” signage and vehicle weight restrictions, would be reinstated.² Pre-February 2003 security patrols would be reinstated. This alternative has no provision for traffic control devices or traffic management procedures associated with access to or exit from the industrial complex that houses the operations and maintenance facilities of the dam. Therefore, periodic temporary, short-term road closures, as occurred before February 2003, would be needed during high security times and for routine and/or emergency dam maintenance activities and construction of flood control improvements.

This alternative allows relatively unrestricted access to and across the dam. As a result, this alternative presents the greatest security risk from vehicular access to the dam facility. Under this alternative, Federal, State, and contract personnel will experience delays getting into or out of the industrial complex at the dam. Increasing traffic due to public use of Folsom Dam Road will also increase the burden on Reclamation to provide road repair and maintenance services.³ Implementing this alternative raises the risk of accident-related liabilities for Reclamation. Most importantly, however, allowing unrestricted access along Folsom Dam Road does not meet Reclamation’s purpose and need for minimizing security risks and maximizing safety of the dam and downstream areas.

2.2.2 Preferred Alternative

The Preferred Alternative is the alternative that Reclamation believes would fulfill its statutory mission and responsibilities and provide the greatest measure of public safety, giving consideration to economic, environmental, technical and other factors. The concept of the “preferred alternative” is different from the “environmentally preferable alternative,” although in some cases one alternative may be both. It is identified so that agencies and the public can understand the lead agency’s orientation. Section 1502.14(e) of the Council on Environmental Quality Regulations requires the section of the EIS on alternatives to “identify the agency’s preferred alternative if one or more exists, in the draft statement, and identify such alternative in the final statement.” This means that if the agency has a preferred alternative at the Draft EIS stage, that alternative must be labeled or identified as such in the Draft EIS.

The Preferred Alternative would constitute a long-term closure of Folsom Dam Road between Folsom-Auburn Road and East Natoma Street to restrict public access. Essentially, the current road closure would be continued permanently. Only authorized Reclamation, law enforcement,

² Although restrictions on trucks and commercial vehicles were in place prior to the February 2003 road closure, the enforcement of those restrictions had been at issue. Under the No Action Alternative, it is assumed that the restrictions would be reinstated and enforced.

³ Based on information from Reclamation’s automated maintenance management system (MAXIMO), the direct cost of these responsibilities is estimated at \$75,000 annually. Repaving the road, which would be necessary in advance of reopening the road, is expected to cost approximately \$1 million.

and emergency response vehicles would be permitted on Folsom Dam Road for maintenance, security reasons, or emergency access/passage. This alternative provides for the greatest level of risk reduction and security with respect to reducing a threat related to access along Folsom Dam Road. This alternative does not eliminate or address all risks to the facility; it only affects potential risks related to vehicular use of Folsom Dam Road, which is the subject of this EIS.

Identification of a Preferred Alternative for purposes of the Draft EIS does not foreclose the option of selecting, in the Final EIS and ROD, a reopening of the road to weekday commuter traffic pending completion of the new bridge (Folsom Dam Bypass). Reclamation has identified potential environmental, economic, and quality of life effects of full closure of Folsom Dam Road that may occur before the new bridge over the American River can be opened to traffic.

2.2.3 Restricted Access Alternatives 2 and 3

The City of Folsom originally proposed three alternatives with input from other potentially affected cities, counties, and State agencies. Two of the three proposed alternatives were advanced for further evaluation in this EIS and are described in this section. In addition to the design features analyzed in this document, each of the alternatives may include options such as access restrictions based on size, type of vehicle, or other control measures.

The City of Folsom’s objective is to achieve a limited, temporary reopening of Folsom Dam Road until a new bridge parallel to Folsom Dam Road can be constructed and opened to traffic (anticipated for completion in 2007/2008; see Sections 2.3 and 3.11.2). The city’s proposed alternatives would involve a system of additional traffic control and security measures implemented by affected jurisdictions to address potential risks to Reclamation facilities from allowing access along Folsom Dam Road.

Under any alternative that involves public access to Folsom Dam Road, a security review would be required of every vehicle using the road. While the exact nature and design of the inspection has not been defined, this requirement would impede traffic flow, causing a delay in travel time and limiting the overall capacity of Folsom Dam Road to carry traffic. To reduce delays, either multiple inspection facilities would be required to process a higher volume of traffic, or the average time required to inspect vehicles would have to be minimized. Table 2-2 shows how longer delays due to an inspection process would restrict the number of vehicles that can cross the road, even with multiple inspection facilities.

Table 2-2 Relationship of Roadway Capacity and Delay

Inspection Delay per Lane (minutes:seconds)	Number of Inspection Lanes		
	1 Lane	2 Lanes	3 Lanes
	Roadway Capacity (vehicles per lane per hour)		
0:00	1,000	NA	NA
0:15	240	480	720
0:30	120	240	360
0:45	80	160	240
1:00	60	120	180
1:15	48	96	144
1:30	40	80	120
1:45	34	69	103
2:00	30	60	90

Source: City of Folsom submittal to Reclamation, August 2004

Table 2-2 shows that a road’s capacity to carry traffic declines relatively quickly with increased delay. For example, on a one-lane roadway, a delay of 15 seconds per vehicle reduces the road’s

capacity from 1,000 vehicles per hour to 240 vehicles per hour. Increasing the delay from 15 to 30 seconds reduces the road's capacity again by half, from 240 to 120 vehicles per hour. Adding a second or third lane increases the roadway's capacity, but if longer delays occur (on the average of 1.5 to 2 minutes per vehicle), the addition of inspection lanes would not substantially increase traffic capacity. In general, Table 2-2 indicates that average delay times of 30 to 45 seconds or greater per vehicle begin to substantially limit roadway capacity unless lanes are added or the average delay time per vehicle is reduced.

The City of Folsom developed conceptual security measures that were proposed to Reclamation as a possible means of providing restricted use of Folsom Dam Road. As proposed, the security measures include establishing a coordinated or linked information board on both East Natoma Street and Folsom-Auburn Road near their existing intersections with Folsom Dam Road. These message boards would notify drivers whether the road is open (see "Hours Open" in Table 2-1) or provide other traffic information that might assist drivers in deciding whether to take Folsom Dam Road or another route. Drivers turning from either Folsom-Auburn Road or East Natoma Street onto Folsom Dam Road would approach a checkpoint zone where their vehicles would be subject to inspection. Once passed or cleared through this zone, vehicles would proceed along Folsom Dam Road to the other end.

A key element of the City of Folsom's proposal is the requirement for permits or prescreening for all vehicles that use Folsom Dam Road. Drivers would have to apply beforehand for a permit that would be permanently affixed to their vehicles, and only those vehicles clearly displaying the permit would be allowed access to Folsom Dam Road through the inspection system. Vehicles not displaying a permit would be immediately turned back and denied access. Permitted vehicles would pass through an area where inspection personnel could see the vehicle and driver. These vehicles would be subject to being stopped for additional inspection at the discretion of the inspection staff or at random. The objective of the city's proposed inspection process is to allow greater access across the dam and to maximize traffic flow and efficiency while providing the opportunity to impose denial of access to any vehicle. In achieving this objective, the proposed permit system for the Restricted Access Alternatives would allow for permitted but uninspected vehicles (subject to inspection, but not necessarily inspected each trip) to access and cross Folsom Dam Road. The city's proposed system is based on restricting vehicle size, type, and weight loads combined with the permit system and random inspection to minimize risk.

The conceptual elements of the City of Folsom's proposed security measures include the following:

- Allow permit-only access to previously cleared drivers and vehicles
- Restrict vehicle size, types, and weight loads
- Install and operate inspection facilities at the entrances to the facility staffed by law enforcement personnel
- Install barriers or systems that can be activated as necessary to restrict or prevent access or egress at the facility
- Conduct random vehicle searches at inspection facilities
- Employ latest search technology
- Provide rapid-response tow service to immediately clear stalled vehicles

- Increase surveillance and communication at the facility
- Install emergency access systems for police and fire vehicles
- Close Folsom Dam Road for necessary maintenance and flood protection improvements and in response to specific threats

Construction of security and inspection facilities would be required for any Restricted Access Alternative. The City of Folsom proposes that these facilities would be temporary and could be removed when traffic can be diverted permanently to the proposed Folsom Dam Bypass. The inspection facilities, associated turning and holding lanes, and other related facilities would require an area of not more than one acre at each end of Folsom Dam Road. Inspection facilities would be established at each end of the road to provide for traffic flow in each direction. The inspection facilities would be approximately 75 to 100 feet wide and 300 to 400 feet long, although exact dimensions and layouts have not been estimated. The inspection and security facilities would be located on or adjacent to existing road alignments, and other elements including turning lanes and signage would be located on or immediately adjacent to existing roads or rights-of-way. It is expected that the facilities could be installed without impacting existing structures.

A potential exists for traffic to build up while waiting to pass through the inspection facilities. The city estimates that traffic queues from Folsom Dam Road onto either Folsom-Auburn Road or East Natoma Street, if or when they occur, could be accommodated within or adjacent to existing roadway facilities without requiring any additional improvements (such as pavement widening).

Certain costs would be associated with the construction of inspection facilities. Additional environmental review and permitting requirements would also likely be associated with these alternatives. These additional costs are associated with security and with annual repair and maintenance of the road and its related facilities. Final assignment of costs would probably depend on a formal negotiated agreement between the City of Folsom and Reclamation in the event that Restricted Access Alternative 2 or 3 is adopted.

2.3 ALTERNATIVES CONSIDERED AND ELIMINATED FROM DETAILED STUDY

2.3.1 Restricted Access Alternative 1

One alternative forwarded to Reclamation by the City of Folsom was considered but eliminated from detailed study. Scenario 1, similar to Restricted Access Alternatives 2 and 3 described above, proposed to open the road to public traffic on a controlled basis with vehicle inspection. Scenario 1 proposed to allow two-way public access for passenger cars, motorcycles, and noncommercial pickup trucks 7 days per week for 3-hour peak commute travel times Monday through Friday and 9 AM to 5 PM on Saturday and Sundays, with a maximum volume of 2,000 vehicles per hour. Reclamation considered and rejected this alternative as not meeting the purpose and need because it would not allow for the increased security necessary to minimize risk to the facility.

2.3.2 New American River Bridge Alternative

Another alternative recommended by the City of Folsom and reviewed by Reclamation was the construction of a bridge parallel to Folsom Dam Road. The Folsom Dam Road Access Restriction is the result of Reclamation's determination that continued access across Folsom Dam Road poses an unacceptable risk. The purpose and need of this action, as stated in Section 1.1, is to control access to Folsom Dam, including all traffic on Folsom Dam Road, and to minimize the security risks and maximize safety to downstream areas. Although a bridge parallel to Folsom Dam Road would provide additional traffic capacity, it would not address the basic purpose and need of controlling access to the dam facility. It was therefore not considered as an alternative. Although a bridge below Folsom Dam has been considered in the past, including as an alternative to the Lake Natoma Crossing completed in 1999, it has not proceeded to the stage of more detailed preliminary design and environmental review until recently. Since the initiation of the NEPA review process for the Folsom Dam Road Access Restriction, the U.S. Army Corps of Engineers has begun a separate and independent project to evaluate another crossing of the American River (referred to as the Folsom Dam Bypass Project). The Folsom Dam Bypass Project is discussed further in Sections 3.1 and 3.11.2.

2.3.3 Bicycle and Pedestrian Access Alternative

A third alternative considered but not advanced for review was allowing bicycle and pedestrian access on the road. Pedestrians and bicycles were not allowed prior to the February 2003 road closure. This alternative was not considered feasible because it violates a city ordinance on bicycle and pedestrian safety.

This section presents the evaluation of the various resource and community issues potentially affected by the alternatives. Each environmental or community resource area subsection describes the Affected Environment and Environmental Consequences, or impacts. The “project area” described in the Affected Environment sections typically refers to the area within or near the community of Folsom that would be affected by the Folsom Dam Road Access Restriction alternatives. Depending on the subject, this may focus on the general geographic area of Folsom and surrounding communities or on specific streets and roads. “Project area” also refers to areas that would be affected by a failure of Folsom Dam, which would affect downstream areas below the dam and the Sacramento metropolitan and surrounding area.

Cumulative impacts from past, present, and reasonably foreseeable future actions are included in the transportation analysis (Section 3.1) and are also described in Section 3.11.

Mitigation measures are identified for resource areas where adverse impacts are identified. Where no impacts are predicted, no mitigation was identified and no discussion of mitigation is presented.

Other required National Environmental Policy Act (NEPA) findings, such as the discussion of short-term uses of the environment and long-term productivity and irretrievable commitments of resources, are also addressed in Section 3.11.

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This section describes the past (pre-closure), existing (post-closure), and projected future traffic conditions within the area influenced by the Folsom Dam Road closure, and potential impacts and mitigation measures of each of the alternatives. To define the area affected by the Folsom Dam Road Access Restriction and the criteria by which each of the existing and future study years were evaluated, the following subsections describe the study scenarios, evaluation locations (study area), and level of service (LOS) categories that are applied to describe and compare traffic conditions. The description of the affected environment follows the LOS definitions.

Traffic Study Scenarios

The transportation analysis evaluated roadway operations under the following scenarios. Scenarios 1 and 2 are described in Section 3.1.1. Scenarios 3 and 4 are described and evaluated in Section 3.1.2.

1. Existing (Pre-Closure) Conditions based on traffic counts collected prior to the closure of Folsom Dam Road (before February 2003)
2. Existing (Post-Closure) Conditions based on traffic counts collected after the closure of the road in Fall 2003 and Spring 2004
3. Year 2005 (Near-Term) Conditions based on 2005 traffic forecasts
4. Year 2013 (10 Years from Closure) Conditions based on 2013 traffic forecasts

Traffic Analysis Locations

Traffic volumes obtained from counts and travel demand model forecasts are used to describe or define the traffic operations under existing conditions and future conditions, and with and without the alternatives. Evaluation of intersection operations was based on peak-hour traffic volumes and roadway segment operations analysis was based on daily volumes. The near-term analysis (Year 2005 scenario) includes the evaluation of intersection operations and roadway segment operations, using projected traffic volumes generated by applying growth rates to existing volumes. The long-term analysis (Year 2013 scenario) includes the evaluation of roadway segments with traffic projections developed using a modified version of the Sacramento Regional Travel Demand Model (SACMET), the selected traffic forecasting tool. The intersections and roadway segments addressed in the analysis are listed below and illustrated on Figure 3.1-1. Number and letter designations used below correspond with those shown on Figure 3.1-1.

Intersections

1. Folsom-Auburn Road/Folsom Dam Road
2. East Natoma Street/Folsom Dam Road
3. Folsom-Auburn Road/Oak Avenue Parkway
4. Folsom-Auburn Road/Greenback Lane
5. Riley Street/Scott Street
6. Riley Street/Leidesdorff Street



LEGEND:

- ① = Study Intersections
- A = Study Roadways

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**TRAFFIC STUDY
LOCATIONS**

Figure
3.1-1

- 7. Riley Street/Sutter Street
- 8. Riley Street/East Natoma Street
- 9. Folsom Boulevard/East Natoma Street
- 10. East Natoma Street/Coloma Street

Roadway Segments

- A. Folsom Dam Road
- B. Riley Street crossing (Rainbow Bridge)
- C. Folsom Boulevard crossing (Lake Natoma Crossing)
- D. Folsom Boulevard
- E. Folsom-Auburn Road
- F. East Natoma Street

Traffic Level of Service Descriptions

Transportation engineers and planners commonly use a grading system called Level of Service to measure and describe the operation of a roadway network. The LOS grading system qualitatively characterizes traffic conditions associated with varying levels of traffic. LOS varies from LOS A, indicating free-flow traffic conditions with little or no delay, to LOS F, representing oversaturated conditions where traffic flows exceed design capacity, resulting in long queues and delays. Table 3.1-1 describes each service level from the driver’s perspective.

**Table 3.1-1
Qualitative Description of Level of Service**

Level of Service	Driver’s Perception
A	LOS A is the highest quality of traffic flow. Motorists are able to drive at the desired speeds for two- and four-lane roads and can easily make lane changes to pass on four-lane roads. At a traffic signal, all motorists can be served by one green signal phase. Motorists on a stop-controlled approach experience little or no conflicting traffic.
B	LOS B is characterized by light congestion. Motorists are generally able to maintain desired speeds on two- and four-lane roads and make lane changes on four-lane roads. Motorists are still able to pass through traffic signal controlled intersections in one green phase. Stop-controlled approach motorists begin to notice absence of available gaps.
C	LOS C represents moderate traffic congestion. Average vehicle speeds continue to be near the motorist’s desired speed for two- and four-lane roads. Lane change maneuvers on four-lane roads increase to maintain desired speed. Turning traffic and slow vehicles begin to have an adverse impact on traffic flows. Occasionally, motorists do not clear the intersection on the first green phase. Stop-controlled approach motorists begin to experience delay as they wait for available gaps.
D	LOS D is characterized by congestion with average vehicle speeds decreasing below the motorist’s desired level for two- and four-lane roads. Lane change maneuvers on four-lane roads are difficult to make and turning traffic and slow vehicles adversely affect traffic flow. Multiple cars must wait through more than one green phase at a traffic signal. Stop-controlled approach motorists experience queuing due to a reduction in available gaps.

Table 3.1-1, concluded

Level of Service	Driver's Perception
E	LOS E is the lowest grade possible without reaching stop-and-go operations. Driving speeds are substantially reduced, brief periods of stop-and-go conditions can occur on two- and four-lane roads, and lane changes are minimal. At signalized intersections, long vehicle queues can form waiting to be served by the signal's green phase. Insufficient gaps on the major streets cause extensive queuing on the stop-controlled approaches.
F	LOS F represents stop-and-go conditions for two- and four-lane roads. Traffic flow is constrained and lane changes are minimal. Drivers at signalized intersections may wait through several green phases prior to being served. Motorists on stop-controlled approaches experience insufficient gaps of suitable size to cross safely through a major traffic stream.

Source: Fehr & Peers (interpreted from 2000 Highway Capacity Manual).

The City of Folsom's goal is to achieve or maintain LOS C operations throughout the city. In this analysis, levels of service that are worse than "C" (i.e., LOS D, E, and F) are noted as functioning at a level that is below this locally established criterion.

Roadway segments and intersections are evaluated under separate criteria and LOS thresholds; those technical criteria are described in Appendix B.

3.1.1 Affected Environment

The following subsections describe the roadway, transit, bicycle, and pedestrian components of the existing transportation system in the vicinity of Folsom Dam. Existing roadway operations are described for conditions prior to the Folsom Dam Road closure (pre-February 2003) and after the road closure (Fall 2003/Spring 2004). Changes in post-closure operations caused by the City of Folsom traffic management program are also discussed.

3.1.1.1 Transportation Facilities

Roadways

Figure 3.1-1 illustrates the roadway network within the study area. The following describes the regional and local roadway network.

U.S. Highway 50 (US-50) connects the Sacramento area with El Dorado County. Within the area of concern, US-50 runs east-west, and access is provided via the Folsom Boulevard interchange. According to California Department of Transportation (Caltrans; Caltrans 2003), US-50 has an existing (2003) annual average daily traffic volume of approximately 84,000 vehicles (both directions) at Folsom Boulevard.

Folsom Dam Road is a two-lane road that connects Folsom-Auburn Road to East Natoma Street. It was closed to traffic in February 2003. Bicycle and pedestrian traffic has always been restricted on this facility.

Folsom-Auburn Road/Folsom Boulevard provides north-south access between the City of Auburn (north of the study area) and the City of Folsom. North of Greenback Lane/Riley Street, this roadway is called Folsom-Auburn Road; south of Greenback Lane/Riley Street, it is called

Folsom Boulevard. Folsom-Auburn Road is a two-lane undivided north-south arterial north of Folsom Dam Road and a four-lane divided arterial south of Folsom Dam Road. Folsom Boulevard is a four-lane divided arterial in the City of Folsom. Folsom Boulevard crosses Lake Natoma between Greenback Lane and Leidesdorff Street; the Folsom Boulevard crossing is called the Lake Natoma Crossing. The speed limit varies from 40 to 50 miles per hour.

Natoma Street is an east-west roadway extending from Folsom-Auburn Road/Folsom Boulevard to east of Green Valley Road/Blue Ravine Road. This roadway is a two-lane undivided arterial from Folsom Boulevard to Stafford Street. East of Stafford Street to Fargo Way, it is a four-lane undivided arterial. From Fargo Way to Folsom Dam Road, the road is a two-lane undivided arterial. From Folsom Dam Road to Green Valley Road, Natoma Street has two lanes in the eastbound direction and one lane in the westbound direction.

Riley Street extends from Folsom-Auburn Road to east of Blue Ravine Road. This roadway is a two-lane undivided arterial that goes through Folsom's historic downtown and business district. This roadway crosses Lake Natoma between Folsom-Auburn Road/Folsom Boulevard and Scott Street; the Riley Street crossing is called Rainbow Bridge.

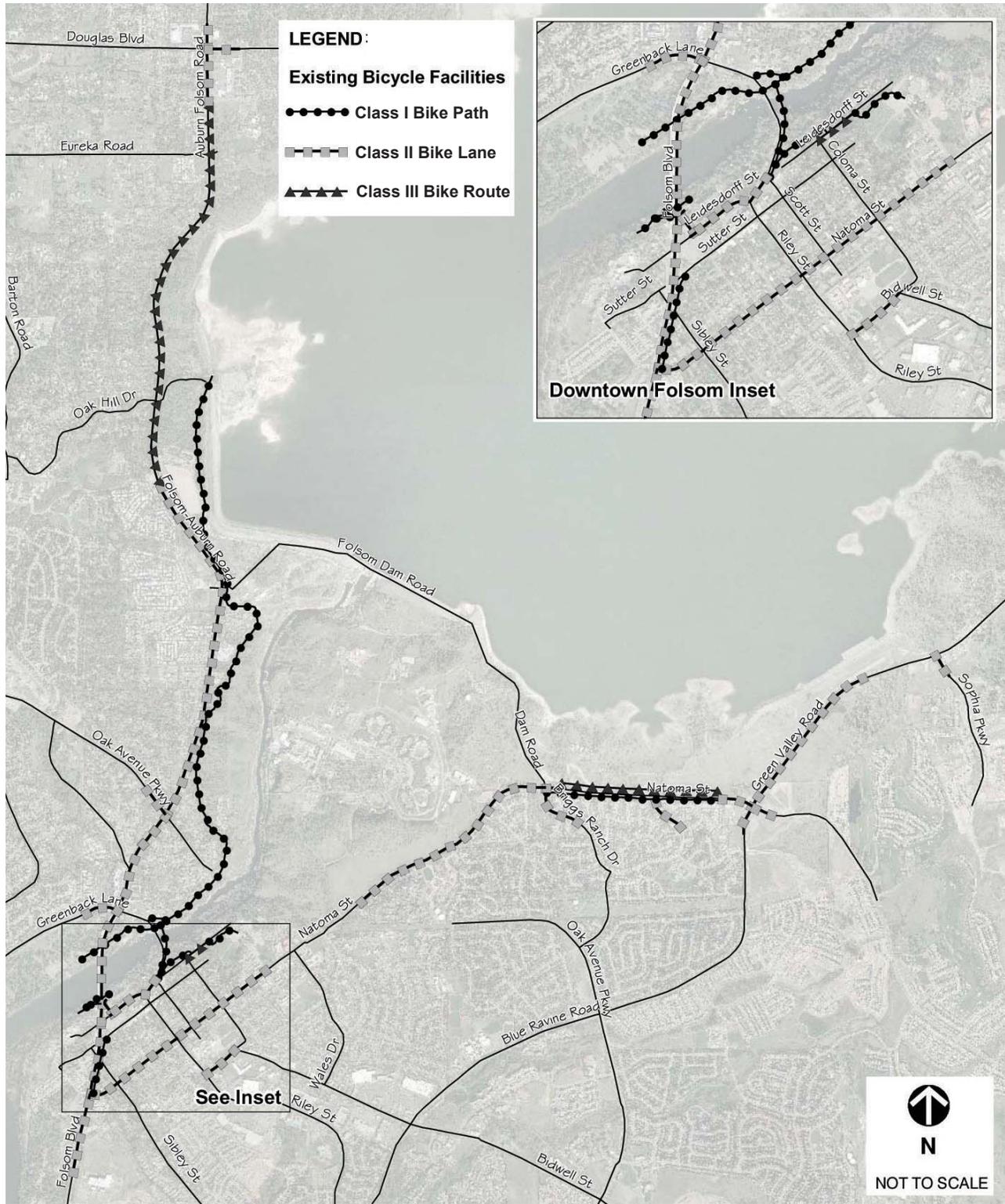
Bicycle and Pedestrian Facilities

Caltrans standards provide definitions for three distinct types of bikeway facilities, as generally described below:

- **Class I Bikeway (Bike Path)** provides a completely separate right-of-way and is designated for the exclusive use of bicycles and pedestrians with vehicle and pedestrian cross-flow minimized.
- **Class II Bikeway (Bike Lane)** provides a restricted right-of-way and is designated for the use of bicycles with a striped lane on a street or highway. Vehicle parking and vehicle/pedestrian cross-flow are permitted.
- **Class III Bikeway (Bike Route)** provides for a right-of-way designated by signs or pavement markings for shared use with pedestrians or motor vehicles.

American River Parkway Trail (Class I) begins in the City of Sacramento and runs along Lake Natoma throughout the City of Folsom. Bicycle lanes are provided on Folsom-Auburn Road/Folsom Boulevard north of Greenback Lane/Riley Street and south of Sutter Street. This roadway is a designated bicycle route between the Sacramento County line and Douglas Boulevard. Bicycle lanes exist on Natoma Street between Folsom Boulevard and east of Mill Street and between Prison Road and Ranch Drive. The City of Folsom Bikeway Master Plan (March 1994) proposes the connection of the two segments on Natoma Street to create a continuous bike lane from Folsom Boulevard to Green Valley Road. The locations of existing bicycle facilities are shown on Figure 3.1-2.

A city-wide Pedestrian Master Plan is currently being developed to identify benefits and disadvantages of the existing pedestrian system and to establish policies, objectives, and priorities for improving this system. Pedestrian facilities are provided throughout historic downtown Folsom and on developed portions of major roadways within the study area.



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EXISTING BICYCLE
FACILITIES

Figure
3.1-2

Transit Service

Bus service in the Sacramento area is provided by the Folsom Stage Line, Roseville Transit, Sacramento Regional Transit, and Placer County Transit. Light rail service is provided by Sacramento Regional Transit. The primary bus service provider within the study area is the Folsom Stage Line, which has the following three lines:

- Route 10 provides service on Folsom-Auburn Road, East Bidwell Street, Riley Street, and Natoma Street. Weekday service is provided from approximately 7:00 AM to 10:00 PM with 30- to 60-minute headways¹. There is no weekend or holiday service.
- Downtown Commuter runs between the City of Folsom and downtown Sacramento on weekdays. Service is provided during the morning commute from approximately 5:45 AM to 8:00 AM with 10- to 20-minute headways and during the evening commute from 3:30 PM to 6:30 PM with 15- to 30-minute headways.
- Light Rail Commuter provides service on Sibley Street, Glenn Drive, and Iron Point Road to the Butterfield Light Rail Station. Service is provided on weekdays from approximately 5:00 AM to 6:00 PM with 60-minute headways.

The Sacramento Regional Transit operates light rail service from downtown Sacramento to the Sunrise Station in Citrus Heights. The Sunrise Station opened in June 2004 and is part of the Amtrak/Folsom Light Rail Project, which will extend light rail 10.9 miles from downtown Sacramento to the City of Folsom. In Folsom, a station is planned at Glenn Drive/Folsom Boulevard and historic downtown.

The existing bus routes and stop locations are shown on Figure 3.1-3.

3.1.1.2 Existing (Pre-Closure) Traffic Conditions

Roadway and intersection operations prior to the road closure were evaluated based on available information from published documents and other data collected before February 2003. A major change to the transportation network in the study area prior to 2003 was the completion of the Lake Natoma Crossing. Completed in 1999, this bridge provided substantial traffic congestion relief as a new crossing of the American River at Lake Natoma, which had been limited to the Riley Street/Rainbow Bridge crossing in the Historic District area and Folsom Dam Road. It created a direct connection of Folsom Boulevard with Folsom-Auburn Road, increasing capacity along this route, but it also attracted additional traffic along and connecting to this corridor. Levels of service along some segments of Folsom-Auburn Road and Natoma Street dropped below the City of Folsom's LOS C criterion. At the same time, population and housing in the City of Folsom and nearby communities also grew substantially over the past decade (see Section 3.4), also contributing to lower traffic service levels on primary arterials. The following describes the traffic conditions prior to the Folsom Dam Road closure in 2003.

¹ Headway refers to the time interval between transit revenue vehicles passing a specific location.

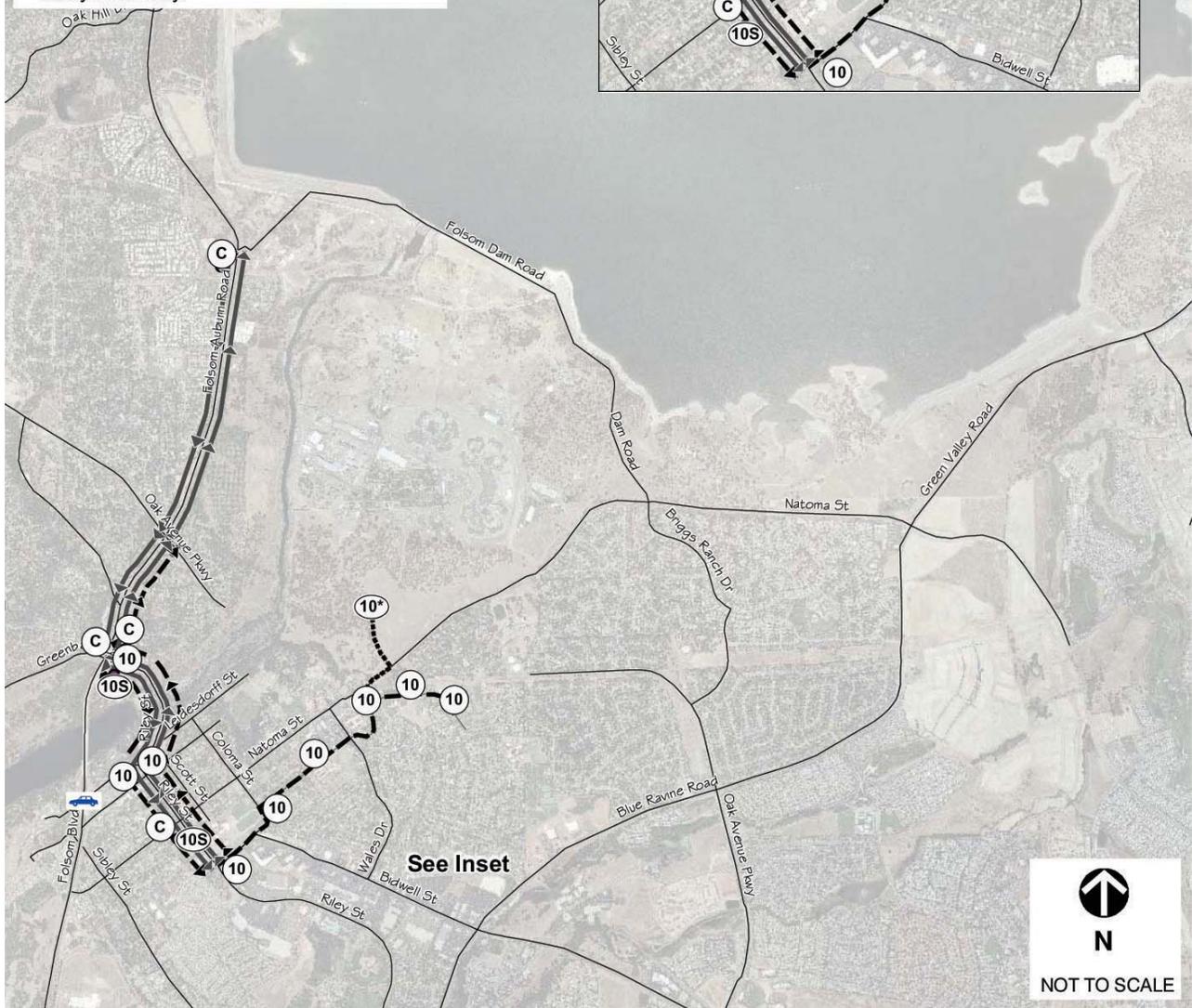
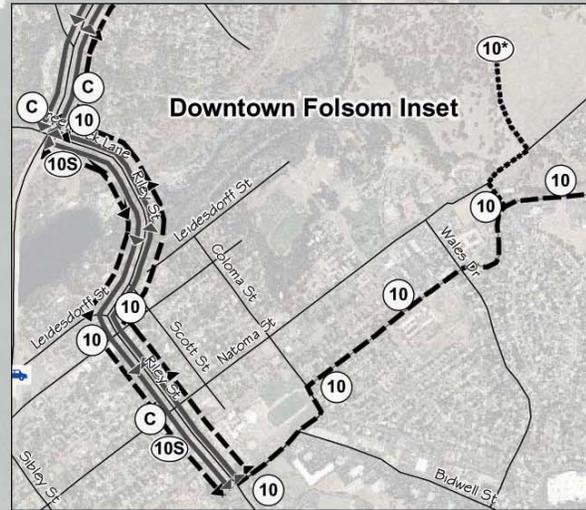
LEGEND:

- ⊙ Downtown Commuter Transit Stop
- ⑩ Route 10 Transit Stop
- ⑩S Route 10 Transit Stop with Shelter
- Downtown Commuter Transit Path
- - - Route 10 Transit Path
-  Future Park-and-Ride Lot

Notes:

* Folsom Prison stop only serviced on Thursday and Friday.

Transit routes and stops shown in study area only.



SCALE: N.T.S.



Folsom Dam Road Restriction EIS

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EXISTING TRANSIT FACILITIES

Figure 3.1-3

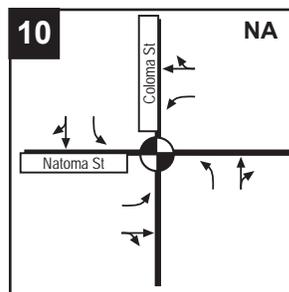
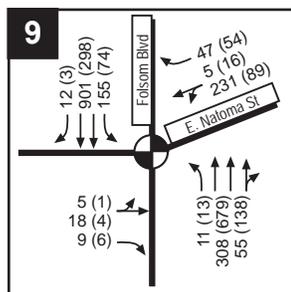
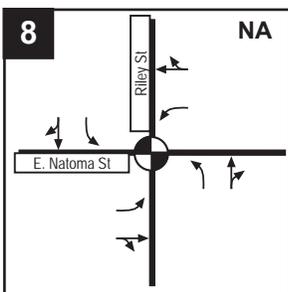
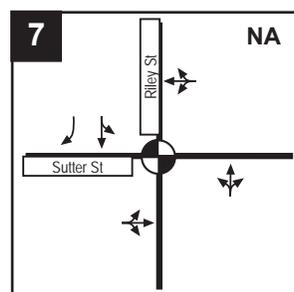
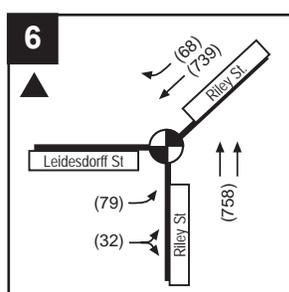
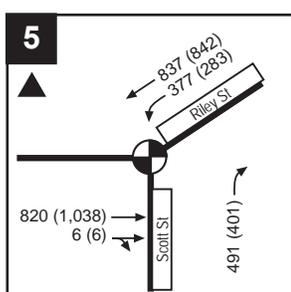
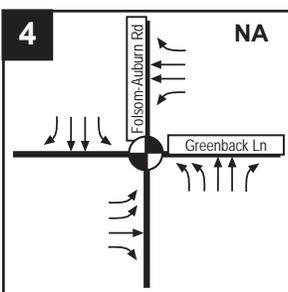
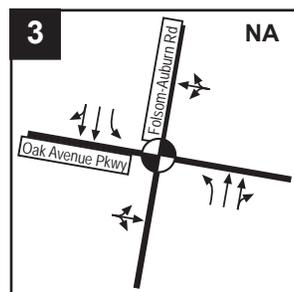
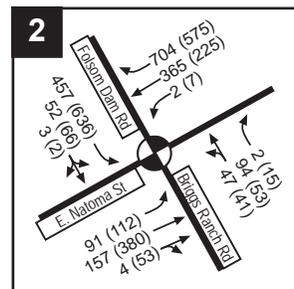
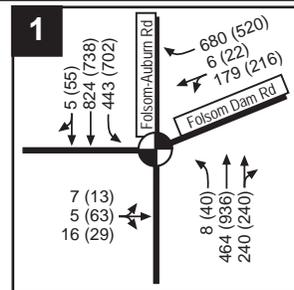
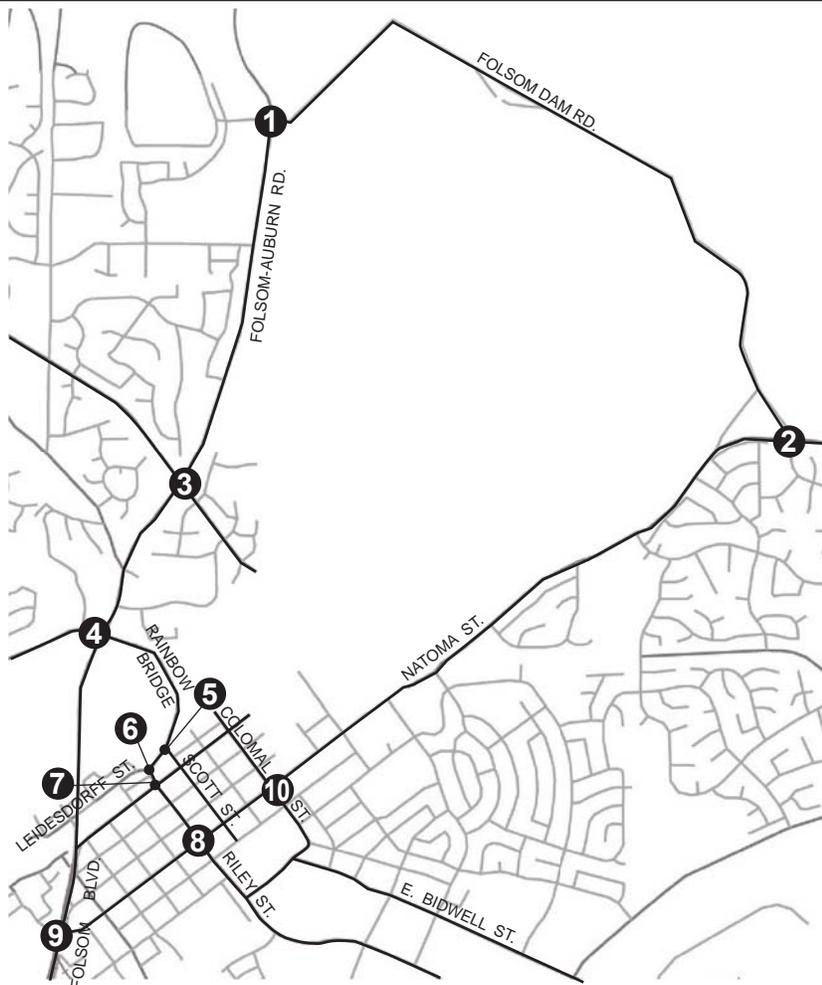
Roadway Segment Operations

Roadway segment levels of service are presented in Table 3.1-2. Pre-closure daily traffic volumes were obtained for all of the roadway segments listed in this table. Only Folsom-Auburn Road between Folsom Dam Road and Inwood Road operated acceptably (i.e., LOS C or better) prior to the closure of Folsom Dam Road. All other study roadway segments operated at LOS D or worse. Rainbow Bridge operated at LOS F due to relatively high volumes throughout the day instead of typical roadway peaking characteristics (i.e., lower volumes during non-peak hours followed by higher traffic volumes during commute periods).

Intersection Operations

Morning (7:00 AM to 9:00 AM) and evening (4:00 PM to 6:00 PM) peak period turning movement counts for conditions prior to the road closure were available for the Folsom-Auburn Road/Folsom Dam Road, East Natoma Street/Folsom Dam Road, Riley Street/Scott Street, and Folsom Boulevard/East Natoma Street intersections. PM peak-hour turning movements were available for the Riley Street/Leidesdorff Street intersection. Peak-hour intersection turning movement volumes, lane configurations, and traffic control devices (traffic signals) for pre-closure conditions are presented on Figure 3.1-4. Some of the peak-hour volumes are “metered” volumes (i.e., counted volumes are less than the actual demand) due to an upstream/downstream bottleneck and are identified on Figure 3.1-4.

The results of the intersection LOS calculations are presented in Table 3.1-3. Prior to February 2003, some congestion was observed by Fehr & Peers staff at the Folsom-Auburn Road/Folsom Dam Road intersection largely due to commuter traffic using Folsom Dam Road. In addition, congestion was observed at the Folsom Boulevard/Greenback Lane intersection due to commuter traffic using the Rainbow Bridge and Lake Natoma Crossing. However, no count information was available for this intersection so a level of service calculation could not be conducted.



LEGEND:
 XX (YY) – AM (PM) Peak Hour Traffic Volumes
 NA = Traffic Counts Not Available
 – Traffic Signal
 = Volumes "metered" due to bottlenecks

SCALE: N.T.S.



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PRE-CLOSURE PEAK HOUR INTERSECTION TRAFFIC VOLUMES AND LANE CONFIGURATIONS

Figure 3.1-4

**Table 3.1-2
Existing Roadway Segment Levels of Service**

Roadway	Facility Type	Pre-Closure			Post-Closure (Pre-City TC Program) ¹			Post-Closure (Post-City TC Program) ²		
		Count Date	Daily Traffic Volumes (vpd)	LOS	Count Date	Daily Traffic Volumes (vpd)	LOS	Count Date	Daily Traffic Volumes (vpd)	LOS
Folsom Dam Road	2-Lane Arterial	2000	17,500	D	-	-	-	-	-	-
Riley Street Crossing (Rainbow Bridge)	2-Lane Arterial	2002	36,700	F	2003	44,700	F	2004 ³	46,500	F
Folsom Boulevard Crossing (Lake Natoma Crossing)	4-Lane Arterial, Divided	2002	32,600	D	2003	33,600	D	2004 ³	34,900	D
Folsom Boulevard (between Blue Ravine Drive and Iron Point Road)	4-Lane Arterial, Divided	1994	25,700	D	NA	NA	NA	2004	30,600	D
Folsom-Auburn Road (between Folsom Dam Road and Inwood Road)	4-Lane Arterial, Undivided	1996	15,300	B	NA	NA	NA	2004	27,500	E
Folsom-Auburn Road (between Oak Avenue Parkway and Greenback Lane)	4-Lane Arterial, Divided	2000	31,500	D	NA	NA	NA	2004	39,400	F
Natoma Street (between Folsom Boulevard and Sibley Street)	2-Lane Collector	1999	7,100	D	2003	12,100	F	NA	NA	NA
East Natoma Street (between Cimmaron Circle and Folsom Dam Road)	2-Lane Arterial	1998	10,500	D	2003	17,700	E	NA	NA	NA

Source: Fehr & Peers

¹ Prior to implementation of City of Folsom’s traffic calming (TC) program.

² After implementation of City of Folsom’s traffic calming program.

³ Daily traffic volume for 2004 was developed using a growth factor of 4 percent per year.

NA = Traffic counts not available.

vpd = vehicles per day

**Table 3.1-3
Existing Intersection Levels of Service**

Intersection	Peak Hour	Pre-Closure			Post-Closure (Pre-City TC Program) ¹			Post-Closure (Post-City TC Program) ²		
		Count Date	Delay	LOS	Count Date	Delay	LOS	Count Date	Delay	LOS
Folsom-Auburn Road/ Folsom Dam Road	AM PM	6/2002	42 >80	D F	-	NA	NA	5/2004	9 8	A A
East Natoma Street/ Folsom Dam Road	AM PM	2001	24 24	C C	-	NA	NA	6/2004	11 8	B A
Folsom-Auburn Road/ Oak Avenue Parkway	AM PM	-	NA	NA	-	NA	NA	5/2004	60* 58*	E E
Folsom-Auburn Road/ Greenback Lane	AM PM	-	NA	NA	2003	>80 >80	F F	6/2004	>80 >80	F F
Riley Street/Scott Street	AM PM	2001	40* 16*	D B	2003	51* 23*	D C	6/2004	4* 7*	A A
Riley Street/Leidesdorff Street	AM PM	2001	NA 5*	NA A	-	NA	NA	6/2004	3* 8*	A A
Riley Street/Sutter Street	AM PM	-	NA	NA	-	NA	NA	6/2004	10* 24*	A C
Riley Street/ East Natoma Street	AM PM	-	NA	NA	2003	57* >80	E F	5/2004	74* >80	E F
Folsom Boulevard/East Natoma Street	AM PM	4/1998	23 15	C B	2003	>80 56*	F E	5/2004	30* 37*	C C
Natoma Street/ Coloma Street	AM PM	-	NA	NA	2003	>80 69*	F E	6/2004	16* 26*	B C

Source: Fehr & Peers

Notes:

¹ Prior to implementation of City of Folsom's traffic calming (TC) program.

² After implementation of City of Folsom's traffic calming program.

* = Delay is higher than indicated and LOS may be worse due to queue spillback from upstream intersection.

NA = Traffic counts not available.

Along congested corridors, queues from upstream intersections spill back into adjacent intersections, causing high intersection delays. The resulting counted volumes are low because only a few vehicles can travel through the intersection. The intersection operations analysis is based on the measured volume and therefore produces a low delay estimate. These intersections are identified with an asterisk (*) in Table 3.1-3, in the "Delay" column.

Riley Street and Folsom Boulevard were congested corridors prior to the Folsom Dam Road closure. Therefore, intersection delays would be higher than indicated along these corridors. Two of the study intersections with available counts operated at LOS levels below C. The Folsom-Auburn Road/Folsom Dam Road and Riley Street/Scott Street intersections operated at LOS D during the AM peak hour, which is considered unacceptable by the City of Folsom threshold criteria. During the PM peak hour, only the Folsom-Auburn Road/Folsom Dam Road

intersection operated below the local LOS C criterion. Detailed calculations are presented in Appendix B.

3.1.1.3 Existing (Post-Closure) Traffic Conditions

Traffic patterns and traffic conditions in the study area changed following the closure of Folsom Dam Road. Much of the traffic that had been using Folsom Dam Road diverted to Rainbow Bridge (Riley Street crossing) and Lake Natoma Crossing (Folsom Boulevard crossing), causing increased congestion at the Folsom Boulevard/Folsom-Auburn Road/Riley Street/Greenback Lane intersection and on several streets in the City of Folsom, most notably Riley Street and East Natoma Street. The City of Folsom developed a “traffic calming” program for the historic district in response to the traffic pattern changes. Available data were used to evaluate roadway segment and intersection operations for conditions after the road closure and before implementation of the city’s traffic calming program. New traffic volume counts were also conducted to evaluate traffic operations for conditions after implementation of the City’s program.

Folsom Historic District Traffic Calming Program

The measures and devices implemented in the Folsom Historic District Traffic Calming Program included selected roadway closures (time-restricted and 24-hour), turn restrictions, and neighborhood signage. Traffic signal timing changes and turn-pocket modifications were also implemented to improve traffic flows. Prior to the program, vehicles would travel on neighborhood streets such as Scott Street and Sutter Street to avoid congestion on Riley Street. The traffic calming program placed a diverter at the Sutter Street/Scott Street intersection, which allows only right turns in the southbound direction. The implementation of this diverter virtually eliminated the left turns at the Riley Street/Scott Street intersection. Signs were posted at the East Natoma Street/Coloma Street intersection indicating no Riley Street crossing access via Coloma Street. These signs caused a dramatic decrease in peak-hour traffic on Coloma Street. In general, the program benefits and is receiving support from residents of streets with decreased traffic volumes. Others have commented that the program limits access to their business establishments.

Roadway Segment Operations

Traffic data used for this analysis consisted of roadway volumes for post-Folsom Dam Road closure, and pre- and post-closure implementation of the traffic calming program. Because different years were represented by the sets of traffic data, volumes were adjusted to matching years applying a 4 percent per year growth rate (applied to the Riley Street and Folsom Boulevard crossings).

The resulting roadway segment levels of service are presented in Table 3.1-2. With the Folsom Dam Road closure, the only options for crossing Lake Natoma in the study area are the Riley Street and Folsom Boulevard crossings, and all of the roadway segments operate at LOS D or worse both without and with the city’s traffic calming program. Prior to the road closure, approximately 18,000 vehicles used Folsom Dam Road on a daily basis. Approximately 9,000 vehicles per day shifted to Rainbow Bridge and Lake Natoma Crossing, resulting in increased volumes on Folsom-Auburn Road and Riley Street through the center of the Folsom Historic District. The already poor existing operating conditions on these roads (LOS D or worse) were therefore further impacted by the closure action.

Intersection Operations

Peak-hour turning movement counts were available for conditions after the road closure and prior to the traffic calming program implementation for the following intersections.

- Folsom-Auburn Road/Greenback Lane
- Riley Street/Scott Street
- Riley Street/East Natoma Street
- Folsom Boulevard/Natoma Street
- East Natoma Street/Coloma Street

Peak-hour intersection turning movement volumes, lane configurations, and traffic control devices for post-closure/pre-traffic calming program conditions are presented on Figure 3.1-5.

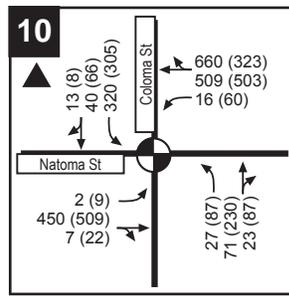
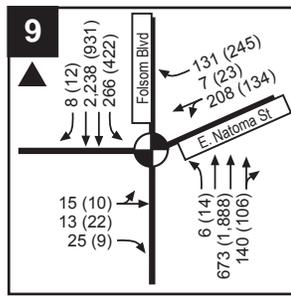
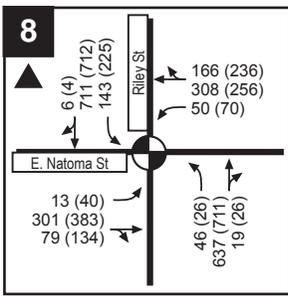
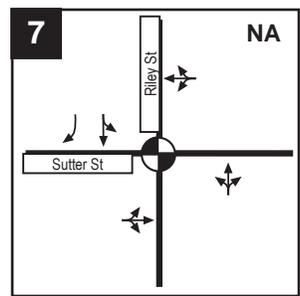
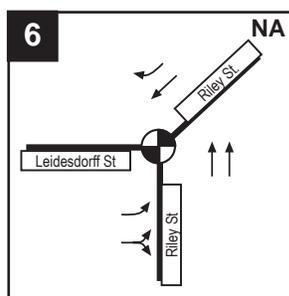
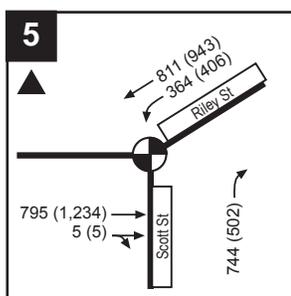
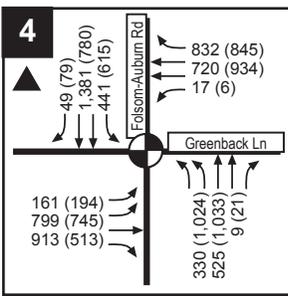
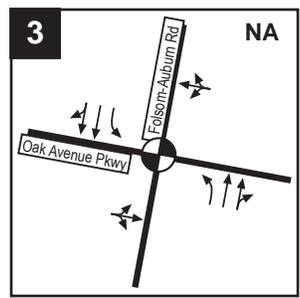
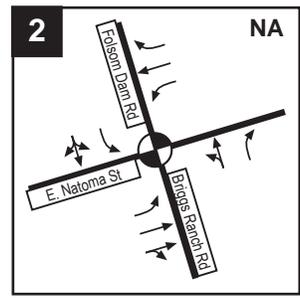
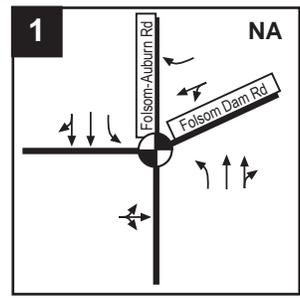
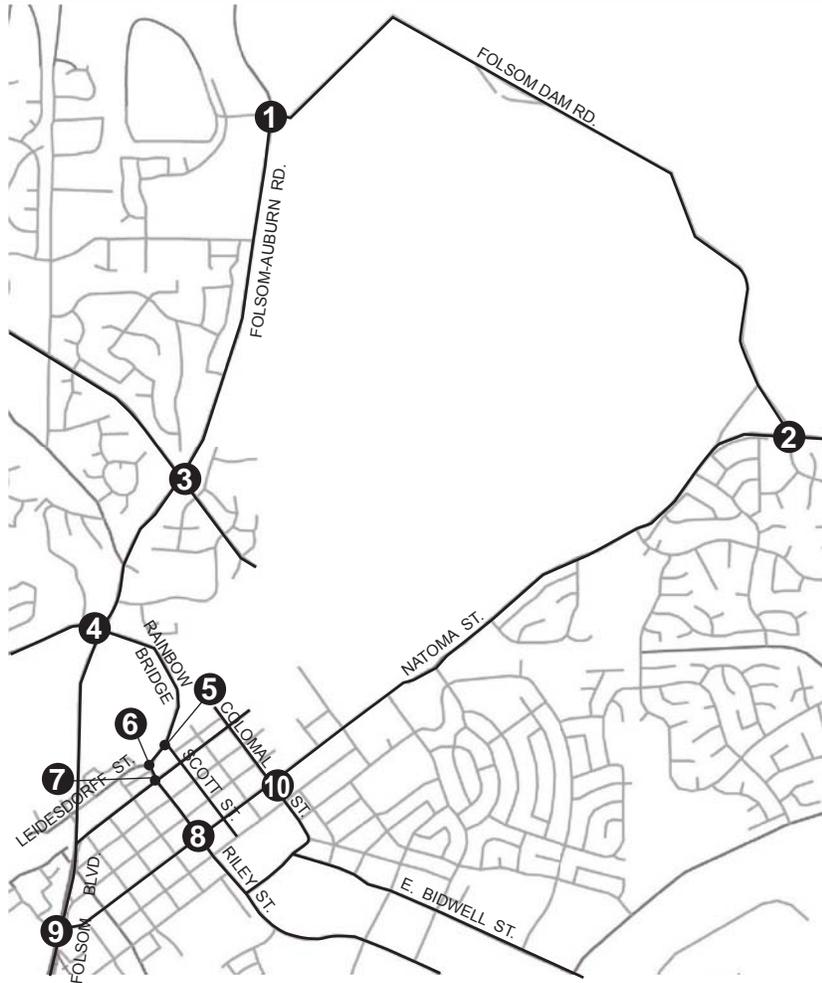
Peak-hour intersection turning movement counts were conducted in May and June 2004 at all study intersections to assess conditions after the Folsom Dam Road closure and after the implementation of the city's traffic calming program. Peak-hour intersection turning movement volumes, lane configurations, and traffic control devices for post-closure/post-traffic calming program conditions are presented on Figure 3.1-6.

The Folsom Dam Road closure increased peak-period spreading and increased congestion along Riley Street, East Natoma Street, and Folsom-Auburn Road. Peak-period spreading is when congested traffic conditions occur for a longer period of time. Before the Folsom Dam Road closure, the evening peak period was approximately 4:00 PM to 6:00 PM. After the closure, the peak period extended or spread from approximately 3:30 PM to 6:30 PM. Increased congestion has also caused a "metering" effect such that the traffic volumes counted at the intersections along the congested corridors are not the actual peak hour demand (i.e., vehicles are unable to get through the intersection due to backup from upstream intersections).

The intersection operations were analyzed to determine the change in delay and LOS, as compared in Table 3.1-3.

With the Folsom Dam Road closure, the two intersections at either end of Folsom Dam Road showed improved operations due to the reduction of traffic on one of the intersection legs. Traffic congestion was observed to increase substantially at the Folsom-Auburn Road/Greenback Lane intersection following the closure. Pre-closure counts are not available, so the magnitude of the increase cannot be quantified. LOS changes from LOS B/C to LOS E/F are reported at the intersections of Folsom Boulevard/East Natoma Street following the Folsom Dam Road closure.

The operations of the Riley Street/Scott Street, Riley Street/Sutter Street, and East Natoma Street/Coloma Street intersections improved due to traffic diversion caused by the City of Folsom's traffic calming program. The intersections of Folsom-Auburn Road/Oak Avenue Parkway, Folsom-Auburn Road/Greenback Lane, and Riley Street/East Natoma Street operated at levels below thresholds set forth by the City of Folsom during both peak periods with the Folsom Dam Road closure and the traffic calming program. Implementation of the traffic calming program compromised regional mobility to preserve the local quality of life and resulted



LEGEND:
 XX (YY) = AM (PM) Peak Hour Traffic Volumes
 NA = Traffic Counts Not Available
 = Traffic Signal
 = Volumes "metered" due to bottlenecks

SCALE: N.T.S.

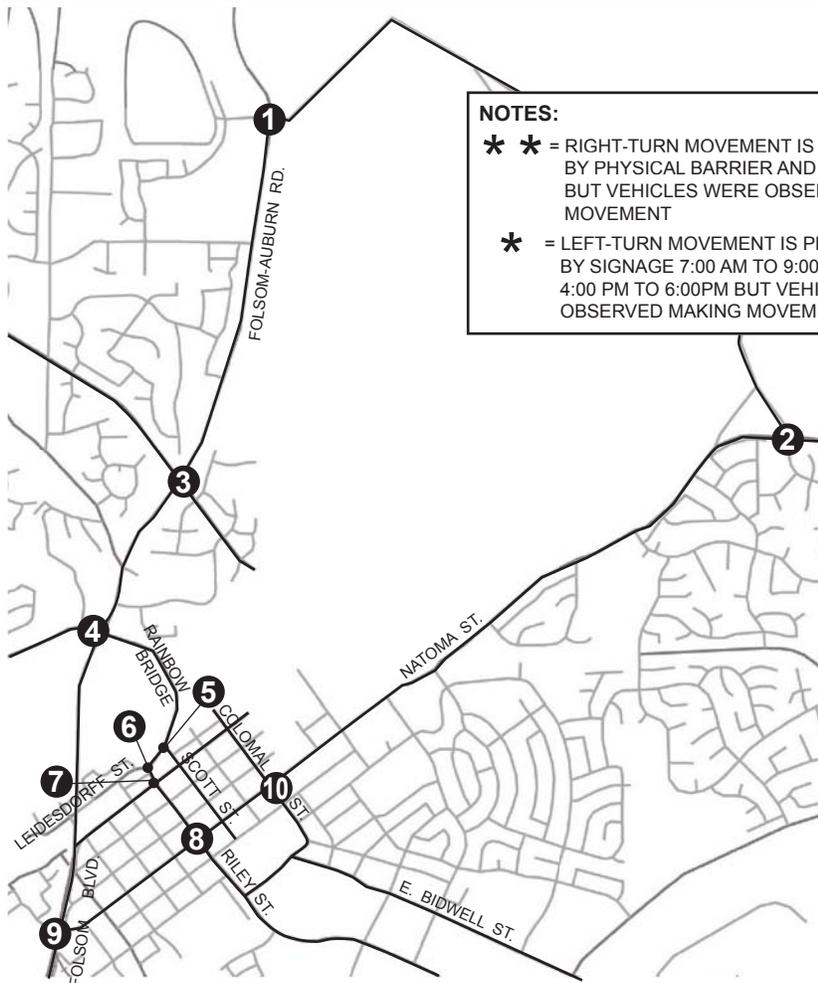


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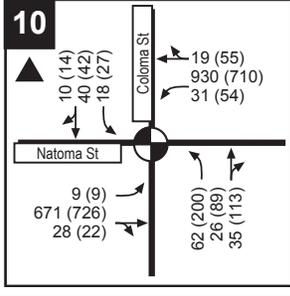
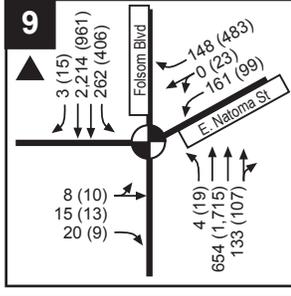
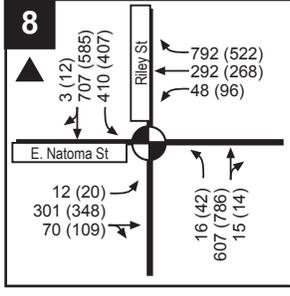
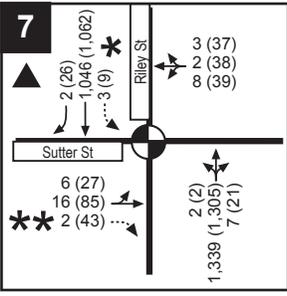
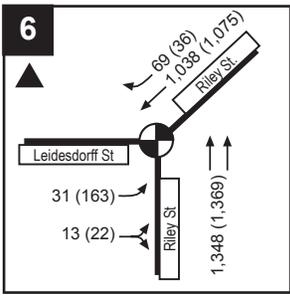
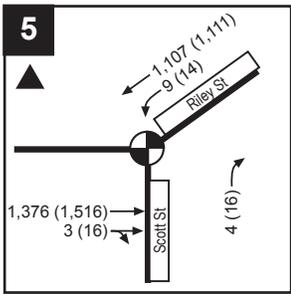
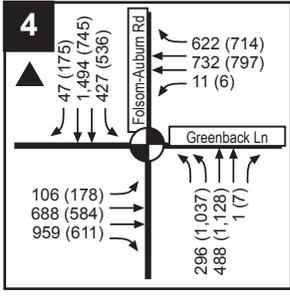
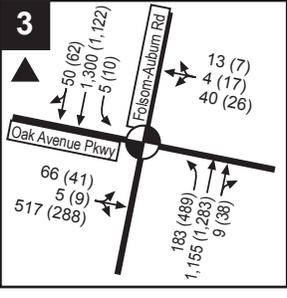
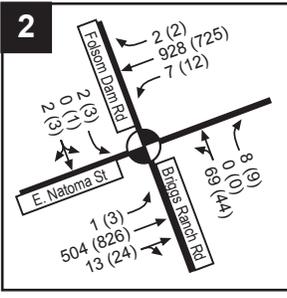
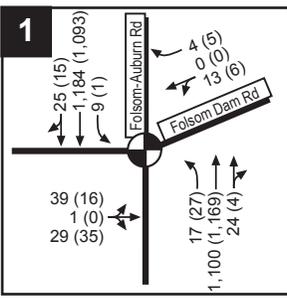
POST-CLOSURE (AND BEFORE TRAFFIC CALMING PROGRAM) PEAK HOUR INTERSECTION TRAFFIC VOLUMES AND LANE CONFIGURATIONS

Figure 3.1-5



NOTES:

- **** = RIGHT-TURN MOVEMENT IS PROHIBITED BY PHYSICAL BARRIER AND SIGNAGE BUT VEHICLES WERE OBSERVED MAKING MOVEMENT
- *** = LEFT-TURN MOVEMENT IS PROHIBITED BY SIGNAGE 7:00 AM TO 9:00 AM AND 4:00 PM TO 6:00PM BUT VEHICLES WERE OBSERVED MAKING MOVEMENT



LEGEND:

XX (YY) = AM (PM) Peak Hour Traffic Volumes

NA = Traffic Counts Not Available

☉ = Traffic Signal

▲ = Volumes "metered" due to bottlenecks

⋯ = Prohibited Movement

SCALE: N.T.S.



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POST-CLOSURE (AND WITH TRAFFIC CALMING PROGRAM) PEAK HOUR INTERSECTION TRAFFIC VOLUMES AND LANE CONFIGURATIONS

Figure 3.1-6

in travel time increases for regional traffic due to implementation of measures to prevent neighborhood cut-through traffic.

Accident Data

The City of Folsom Police Department provided accident statistics for roadways citywide and those affected by the closure of Folsom Dam Road. The Department reported that the number of accidents during a 12-month period (March through February) increased by 16 percent citywide after Folsom Dam Road closed. In addition, during commute days (i.e., Monday through Friday) from March 2002 to February 2003, 310 accidents were reported on roadways affected by the closure. For the same days in 2003 through 2004, 461 accidents were reported. This represents a 49 percent increase in accidents on commute days for roadways impacted by the road closure, although it is based on only one year of post-road closure data. In most cases, an increase in traffic volumes can result in an increase in accidents, which could potentially be associated with the road closure and with traffic increases associated with local and regional growth.

3.1.2 Environmental Consequences

Evaluation Criteria

For traffic analysis, LOS criteria provide a means to compare impacts. The City of Folsom General Plan (1995) identifies LOS C as the city standard or goal for intersection operations. The Sacramento County General Plan (1993) establishes minimum LOS standards of LOS D for rural collectors and LOS E for urban roads. LOS C was used in this study to indicate locally “acceptable” operating conditions applicable in the City of Folsom.

Each of the alternatives is compared to No Action using the LOS scale of impact evaluation. Impacts of the Folsom Dam Road closure are identified if the alternatives result in any of the following:

- Deterioration of roadway segment operations from LOS C (or better) to LOS D (or worse), or addition of traffic to a segment operating at LOS D (or worse) that causes a change in the LOS category (e.g., an LOS of E changes to F)
- Deterioration of intersection operations from LOS C (or better) to LOS D (or worse), or addition of traffic to an intersection operating at LOS D (or worse) that causes a change in the LOS category
- Deterioration of overall travel time
- Interruption of existing or planned future bicycle, pedestrian, and transit operations
- Change in accident rates

As noted in the introduction, the evaluation of impacts is subdivided by two post-road closure study years: 2005 and 2013 (10 years after closure). The analytical methods for each of these study years are presented in the following pages, further broken down by roadway, intersection, travel time, and bike/transit impact categories. Traffic increases attributed to population growth in the City of Folsom were based on local land use planning assumptions, and have been taken into account in the analysis. Impacts for each alternative are discussed in Sections 3.1.2.1 through 3.1.2.3.

2005 Conditions

Year 2005 conditions (one year from the onset of the analysis) were evaluated to determine the near-term effects of the Preferred Alternative and the other alternatives. The No Action Alternative, Preferred Alternative, and Restricted Access Alternatives 2 and 3 were evaluated on a peak-hour intersection and daily roadway segment basis.

Traffic and Roadway Operation Projections. Traffic volumes for 2005 were derived by applying annual growth rates to existing volumes. The annual growth rates were estimated by comparing 2001 and 2013 traffic projections from a modified version of the SACMET travel demand model. (The original SACMET model was developed by the Sacramento Area Council of Governments [SACOG].) The modified version used for this study was refined to include local roadway network and land use details to improve the model's forecasting accuracy in the study area. The model was run with two land use sets (2001 and 2013) and two roadway networks (with and without the Folsom Dam Road closure). The derived annual growth rates are 3.5 to 4.5 percent per year. A description of the SACMET model and forecasting methodology is presented in Appendix B.

Travel Times. Overall roadway operations were also evaluated by comparing travel times between the intersections of Folsom-Auburn Road/Folsom Boulevard and East Natoma Street/Folsom Dam Road via both the Rainbow Bridge and Lake Natoma Crossing in both directions during the AM and PM peak periods. The four routes are:

- Route 1: From Folsom-Auburn Road/Folsom Dam Road intersection to East Natoma Street/Folsom Dam Road intersection via the Rainbow Bridge
- Route 2: From East Natoma Street/Folsom Dam Road intersection to Folsom-Auburn Road/Folsom Dam Road intersection via the Rainbow Bridge
- Route 3: From Folsom-Auburn Road/Folsom Dam Road intersection to East Natoma Street/Folsom Dam Road intersection via the Lake Natoma Crossing
- Route 4: From East Natoma Street/Folsom Dam Road intersection to Folsom-Auburn Road/Folsom Dam Road intersection via the Lake Natoma Crossing

Surveys were performed to measure travel times for 2004 conditions. A modified version of the SACMET model was used to estimate travel times for 2005 No Action and Preferred Alternative conditions. The percent increase in daily traffic volumes between No Action and Restricted Access Alternatives 2 and 3 were applied to the travel times for the No Action Alternative to determine travel times for these alternatives. Travel times are presented in Table 3.1-4.

Roadway Segment Analysis and Impacts. Roadway segment operations were evaluated for the No Action Alternative, Preferred Alternative, and Restricted Access Alternatives 2 and 3. Daily traffic volumes and levels of service for roadway segments are presented in Table 3.1-5. The following discusses the conditions predicted in 2005 for the No Action Alternative (no Folsom Dam Road access restriction) and compares the changes in level of service for the Preferred Alternative and each of Restricted Access Alternatives. The levels of service that are shown in bold in Table 3.1-5 indicate a change in LOS between the No Action Alternative and the Preferred Alternative or Restricted Access Alternatives 2 or 3. Levels of service that are not in bold do not change as a result of the alternatives. Although the volume of vehicles on the

**Table 3.1-4
2005 Peak Hour Travel Times**

Route	From	To	Peak Hour	2005 No Action Alternative (minutes)	2005 Preferred Alternative (minutes)	Restricted Access Alternatives	
						Alternative 2 (minutes)	Alternative 3 (minutes)
1. Rainbow Bridge	Folsom-Auburn Road/ Folsom Dam Road	East Natoma Street/ Folsom Dam Road	AM	14.0	14.0	14.0	14.0
			PM	11.0	11.0	11.0	11.0
2. Rainbow Bridge	East Natoma Street/ Folsom Dam Road	Folsom-Auburn Road/ Folsom Dam Road	AM	10.0	11.0	11.0	11.5
			PM	10.0	13.0	11.0	11.5
3. Lake Natoma Crossing	Folsom-Auburn Road/ Folsom Dam Road	East Natoma Street/ Folsom Dam Road	AM	13.0	18.0	13.0	13.0
			PM	10.0	13.5	10.0	10.0
4. Lake Natoma Crossing	East Natoma Street/ Folsom Dam Road	Folsom-Auburn Road/ Folsom Dam Road	AM	10.0	14.0	10.0	10.0
			PM	13.5	17.5	14.0	14.0

Source: Fehr & Peers

**Table 3.1-5
2005 Roadway Segment Levels of Service**

Roadway	Facility Type	No Action Alternative		Preferred Alternative		Restricted Access Alternatives			
		Daily Traffic Volumes (vpd)	LOS	Daily Traffic Volumes (vpd)	LOS	Alternative 2 (5,800 vpd)		Alternative 3 (3,800 vpd)	
						Daily Traffic Volumes (vpd)	LOS	Daily Traffic Volumes (vpd)	LOS
Folsom Dam Road	2-Lane Arterial	19,800	F	-	-	5,800	C¹	3,800	C¹
Riley Street Crossing (Rainbow Bridge)	2-Lane Arterial	36,500	F	45,300	F	40,300	F	41,800	F
Folsom Boulevard Crossing (Lake Natoma Crossing)	4-Lane Arterial, Divided	35,900	E	36,700	E	36,100	E	36,400	E
Folsom Boulevard (between Blue Ravine and Iron Point Road)	4-Lane Arterial, Divided	30,200	D	30,800	D	30,800	D	30,800	D
Folsom-Auburn Road (between Folsom Dam Road and Inwood Road)	4-Lane Arterial, Undivided	26,000	D	29,600	F	26,500	D	27,700	E
Folsom-Auburn Road (between Oak Avenue Parkway and Greenback Lane)	4-Lane Arterial, Divided	34,900	D	41,200	F	38,300	F	39,300	F
Natoma Street (between Folsom Boulevard and Sibley Street)	2-Lane Collector	8,500	D	13,600	F	10,900	F	11,700	F
East Natoma Street (between Cimmaron Circle and Folsom Dam Road)	2-Lane Arterial	15,700	D	19,800	F	19,800	F	19,800	F

Source: Fehr & Peers

Boldface text indicates a change in level of service with respect to No Action Alternative. Traffic added to roadways already operating at LOS F also shown in bold as these roads would be further affected.

vpd = vehicles per day

¹ The LOS is based on service rate of 960 vehicles per hour. LOS assumes the level of service thresholds for daily traffic volumes are 10% of the peak hour traffic (i.e., LOS C for 2-Lane Arterial is 970 vehicles per hour).

roadway may change as a result of the alternative, it is not substantial enough to cause a noticeable change in the level of service. Where a level of service degrades (e.g., from D to E or F), the impact is adverse. Where it improves (e.g., from C to B or A), the impact is beneficial. Traffic added to a roadway that is already at LOS F would be further adversely impacted; those roadways are also shown in bold.

Intersection Operations and Impacts. Peak-hour intersection turning movement projections for 2005 for No Action and the Preferred Alternative are shown on Figures 3.1-7 and 3.1-8, respectively. The percent increase in daily traffic volumes between No Action and Restricted Access Alternatives 2 and 3 were applied to the intersection delay for the No Action Alternative to determine the intersection operations for those alternatives. LOS calculations were conducted to evaluate intersection operations with the traffic projections. The lane configurations were assumed to be the same as the existing conditions as no planned improvements are to be completed within the year (M. Rackovan, pers. comm., 2004a). The results are presented in Table 3.1-6. Similar to the analysis of roadways, the levels of service that are shown in bold indicate a change in traffic operations at the intersection that is substantial enough to change the estimated level of service.

Table 3.1-6
2005 Intersection Levels of Service

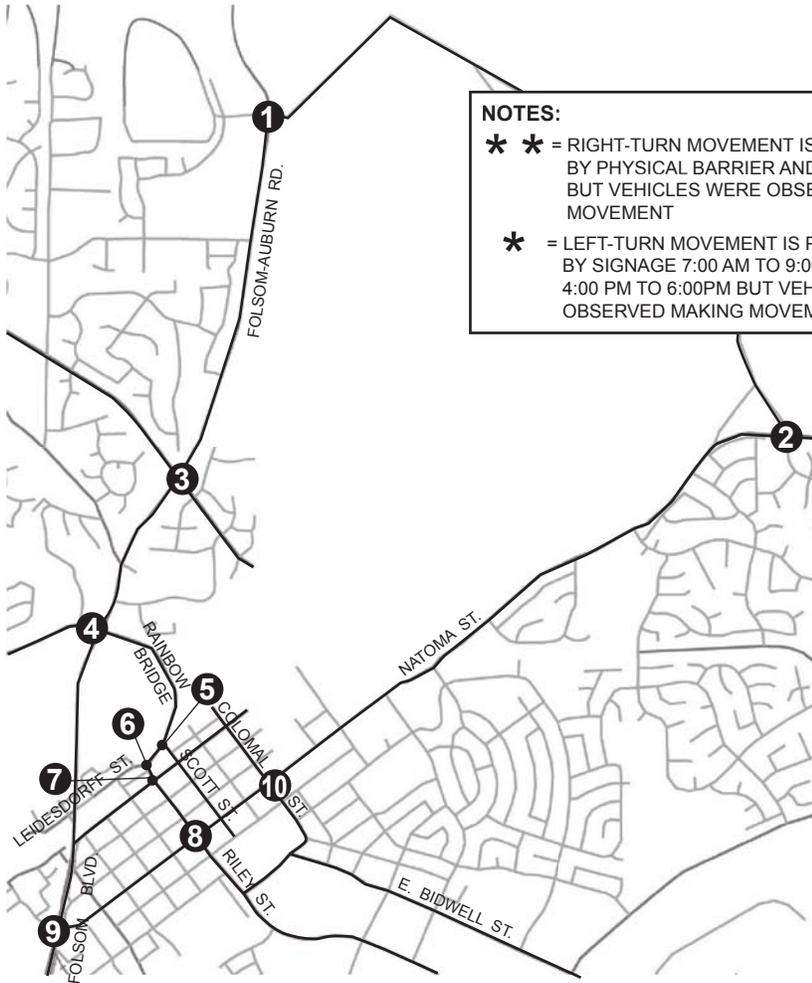
Intersection	Peak Hour	No Action Alternative		Preferred Alternative		Restricted Access Alternatives			
		Delay	LOS	Delay	LOS	Alternative 2 (5,800 vpd)		Alternative 3 (3,800 vpd)	
						Delay	LOS	Delay	LOS
Folsom-Auburn Road/ Folsom Dam Road	AM	>80	F	9	A	63	E	72	E
	PM	>80	F	8	A	>80	F	>80	F
East Natoma Street/ Folsom Dam Road	AM	42	D	11	B	30	C	34	C
	PM	33	C	9	A	23	C	27	C
Folsom-Auburn Road/ Oak Avenue Parkway	AM	60*	E	70*	E	66*	E	68*	E
	PM	51*	D	68*	E	56*	E	58*	E
Folsom-Auburn Road/ Greenback Lane	AM	>80	F	>80	F	>80	F	>80	F
	PM	>80	F	>80	F	>80	F	>80	F
Riley Street/Scott Street	AM	4*	A	5*	A	5*	A	5*	A
	PM	7*	A	8*	A	8*	A	8*	A
Riley Street/ Leidesdorff Street	AM	4*	A	4*	A	4*	A	4*	A
	PM	9*	A	9*	A	9*	A	9*	A
Riley Street/Sutter Street	AM	4*	A	15*	B	5*	A	5*	A
	PM	16*	B	31*	C	18*	B	18*	B
Riley Street/ East Natoma Street	AM	52*	D	>80	F	57*	E	57*	E
	PM	79*	E	>80	F	>80	F	>80	F
Folsom Boulevard/East Natoma Street	AM	25*	C	36*	D	32*	C	36*	D
	PM	38*	D	39*	D	39*	D	39*	D
Natoma Street/ Coloma Street	AM	17*	B	18*	B	18*	B	18*	B
	PM	27*	C	28*	C	28*	C	28*	C

Source: Fehr & Peers

Boldface text indicates a change in level of service with respect to the No Action Alternative. If traffic would be added to a roadway already operating at LOS F, the LOS is also shown in bold as this road would be further affected.

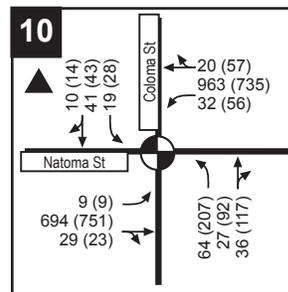
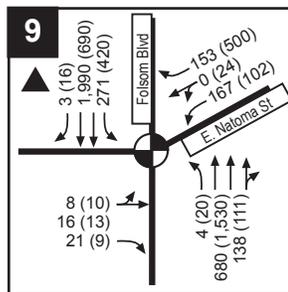
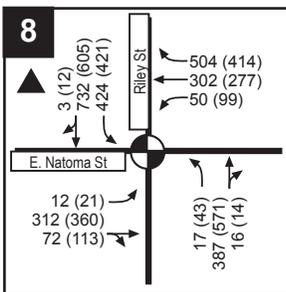
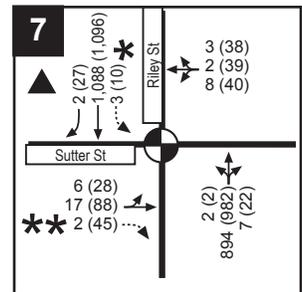
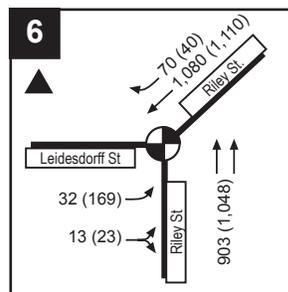
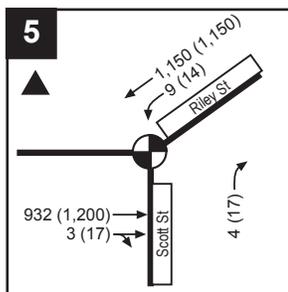
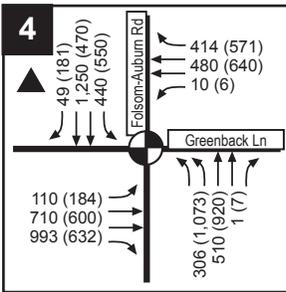
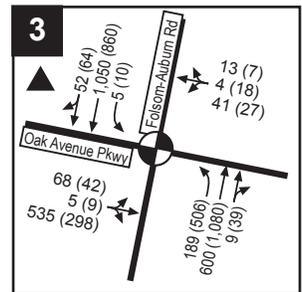
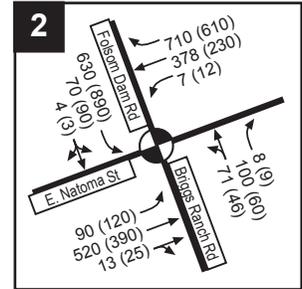
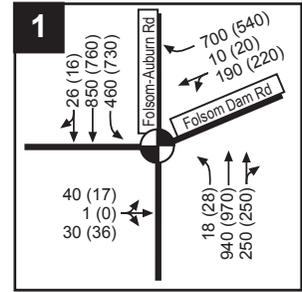
* = Delay is higher than indicated and LOS may be worse due to traffic backup from upstream intersection.

vpd = vehicles per day



NOTES:

- * * = RIGHT-TURN MOVEMENT IS PROHIBITED BY PHYSICAL BARRIER AND SIGNAGE BUT VEHICLES WERE OBSERVED MAKING MOVEMENT
- * = LEFT-TURN MOVEMENT IS PROHIBITED BY SIGNAGE 7:00 AM TO 9:00 AM AND 4:00 PM TO 6:00PM BUT VEHICLES WERE OBSERVED MAKING MOVEMENT



LEGEND:

XX (YY) = AM (PM) Peak Hour Traffic Volumes

NA = Traffic Counts Not Available

⊙ = Traffic Signal

▲ = Volumes "metered" due to bottlenecks

⋯ = Prohibited Movement

SCALE: N.T.S.

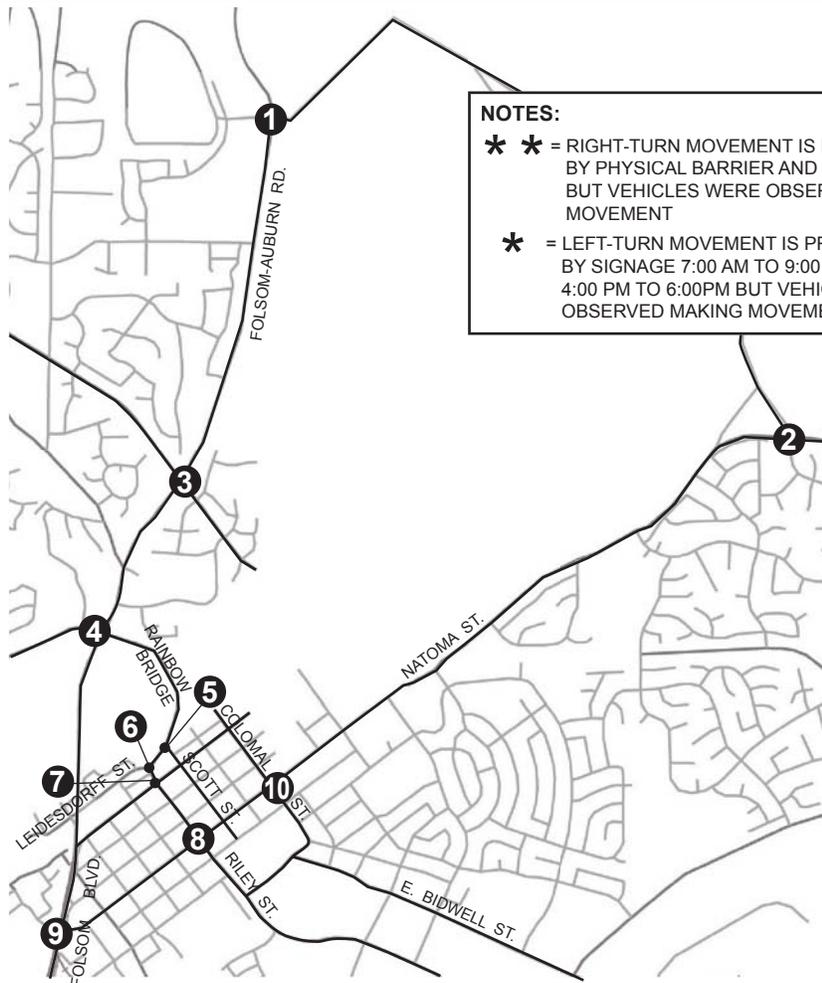


Folsom Dam Road Restriction EIS

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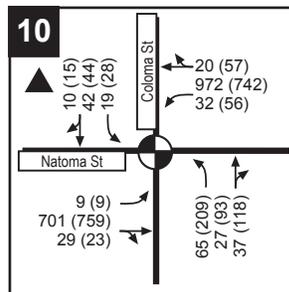
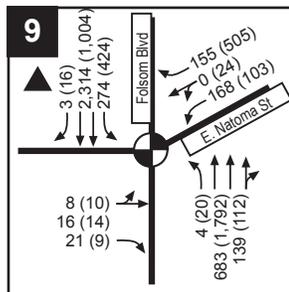
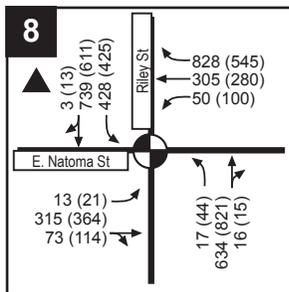
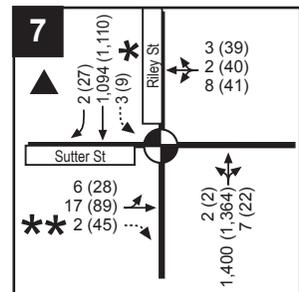
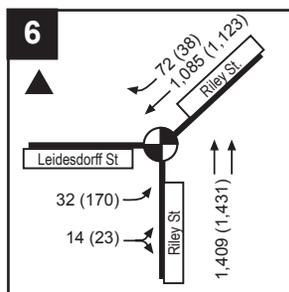
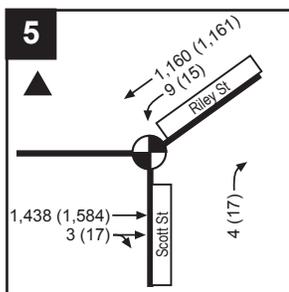
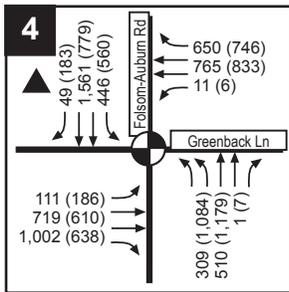
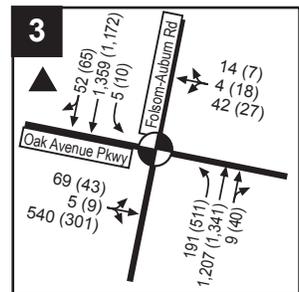
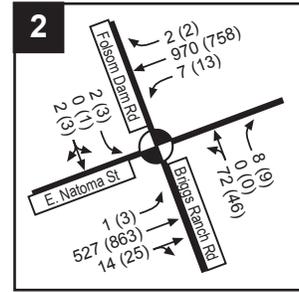
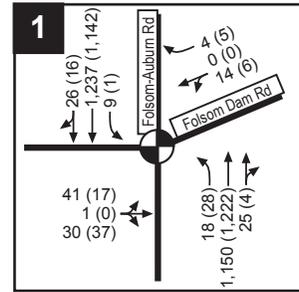
2005 NO ACTION PEAK HOUR INTERSECTION TRAFFIC VOLUMES AND LANE CONFIGURATIONS

Figure 3.1-7



NOTES:

- * * = RIGHT-TURN MOVEMENT IS PROHIBITED BY PHYSICAL BARRIER AND SIGNAGE BUT VEHICLES WERE OBSERVED MAKING MOVEMENT
- * = LEFT-TURN MOVEMENT IS PROHIBITED BY SIGNAGE 7:00 AM TO 9:00 AM AND 4:00 PM TO 6:00PM BUT VEHICLES WERE OBSERVED MAKING MOVEMENT



LEGEND:

XX (YY) = AM (PM) Peak Hour Traffic Volumes

NA = Traffic Counts Not Available

◉ = Traffic Signal

▲ = Volumes "metered" due to bottlenecks

⋯ = Prohibited Movement

SCALE: N.T.S.



Folsom Dam Road Restriction EIS

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2005 PREFERRED ALTERNATIVE PEAK HOUR INTERSECTION TRAFFIC VOLUMES AND LANE CONFIGURATIONS

Figure 3.1-8

2013 Conditions

Year 2013 conditions, 10 years after the initial action of closing Folsom Dam Road, were evaluated to determine the long-term effects of each alternative.

Traffic Modeling Changes and Roadway Operations. To forecast conditions in future years, a modified version of the SACMET model (described in Appendix B) was used. The following describes the adjustments made to the model for this evaluation.

- **Land Use Projections:** Modifications were made to the model to reflect recently approved projects and other land uses anticipated for completion by 2013. A detailed discussion is provided in Appendix B.
- **Transportation System Changes:** The model network was modified to incorporate planned and funded improvements anticipated for completion by 2013. These improvements are described in Table 3.1-7. The Folsom Dam Bypass Project, which would provide a new Lake Natoma crossing, was included in the 2013 analysis although it has not been funded as of the date of this analysis. The project has a construction date of 2007/2008, and the City of Folsom and the U.S. Army Corps of Engineers (USACE) are committed to this delivery date.

**Table 3.1-7
2013 Transportation Improvement Projects Within Regional Study Area**

Location	Description
USACE	
Folsom Dam Bypass	Construct two-lane bridge adjacent to dam
City of Folsom Department of Public Works – Tier 1: Publicly Funded	
Blue Ravine Road	Widen westbound approach to Folsom Boulevard for dual left-turn lanes and exclusive through and right-turn lanes
East Bidwell Street	Widen to six lanes from Oak Avenue Parkway to Blue Ravine Road
East Natoma Street	Widen to four lanes from Fargo Way to Blue Ravine Road
Folsom-Auburn Road	Widen to four lanes from Folsom Dam Road to Beals Point Road
Oak Avenue Parkway	Widen to six lanes from Folsom-Auburn Road to Baldwin Dam Road
Sibley Street	Widen from two to four lanes between Blue Ravine Road and Glenn Drive
Glenn Drive	Widen from two to four lanes between Sibley Street and Folsom Boulevard
City of Folsom Department of Public Works – Tier 1: Developer Funded or Partially Developer Funded	
Broadstone Parkway	Construct four-lane section from Golf Links Drive to Empire Ranch Road
Empire Ranch Road	Construct four-lane section from El Dorado County line to Iron Point Road
Iron Point Road	Extend with four-lane intersection from Grover Road east to East Bidwell Street to El Dorado
U.S. 50 at Empire Ranch Road	Construct four-lane interchange
Sacramento County Department of Transportation – Tier 1: Publicly Funded	
Folsom Boulevard	Widen to four or five lanes, from Sunrise Boulevard to Aerojet Road
Madison Avenue	Widen from four to six lanes, from Sunrise Boulevard to Hazel Avenue
Sacramento County Department of Transportation – Tier 1: Developer- or Partially Developer-Funded	
Greenback Lane	Widen from four to six lanes, from Sunrise to Hazel Avenue
Hazel Avenue	Widen from two to four lanes, from Oak Avenue to Old Auburn Road in Placer County

Table 3.1-7, concluded

Location	Description
Sacramento Regional Transit District – Tier 1: Publicly Funded	
Folsom Light Rail Corridor	Downtown Sacramento to Folsom Light Rail Extension
El Dorado County Department of Transportation – Tier 1: Developer Funded or Partially Developer Funded	
Green Valley Road	Widen from two to four lanes, from the Sacramento/El Dorado County line to San Francisco Drive (includes intersection improvements with signals at various intersections)
Silva Valley Parkway	Construct new two-lane road from Serrano to White Rock Road
Placer County Department of Public Works – Tier 1: Publicly or Developer Funded	
Auburn-Folsom Road	Widen from two to four lanes from Roseville City limits to Oak Hill Drive
Auburn-Folsom Road	Widen from two to four lanes from Douglas Boulevard to Fuller Drive
Auburn-Folsom Road	Widen from two to four lanes from Fuller Drive to Oak Hill Drive

Source: Metropolitan Transportation Plan (MTP) for 2025, SACOG.

- **Traffic Projections:** Traffic projections were developed for all alternatives by incorporating changes to the model network to account for Folsom Dam Road being fully open, being closed, and being open on a limited basis (for Restricted Access Alternatives 2 and 3). Daily growth projected by the model was added to existing daily traffic. A growth rate of 8 percent per year was used for Folsom-Auburn Road, and 9 percent per year was used for East Natoma Street. With the Folsom Dam Bypass Project, some of the vehicles using the Riley Street and Folsom Boulevard crossings would reroute to the new bridge. Therefore, in some cases, volumes in 2013 are lower than existing conditions.

Travel Times. Roadway operations were evaluated by comparing AM and PM peak hour travel times between Folsom-Auburn Road/Folsom Dam Road and East Natoma Street/Folsom Dam Road via the Rainbow Bridge and Lake Natoma Crossing. Table 3.1-8 presents 2013 travel times.

Roadway Segment Analysis. The daily traffic projections and resulting levels of service are presented in Table 3.1-9.

3.1.2.1 No Action Alternative

2005 Conditions

Roadway Operations. All of the roadway segments would operate at a level of service below LOS C under 2005 No Action conditions (i.e., LOS D, E, or F). Under existing conditions prior to the closure of Folsom Dam Road, only one roadway segment on Folsom-Auburn Road operated at an acceptable level (Folsom Auburn Road between Folsom Dam Road and Inwood Road [Table 3.1-2]). By 2005, it is projected to operate at LOS D. Folsom Dam Road is projected to degrade from LOS D to LOS F. All level of service declines from existing conditions to study year 2005 are due to projected growth in the area. There are no impacts from the No Action Alternative since it is the basis of comparison to the other alternatives.

**Table 3.1-8
2013 Peak Hour Travel Times**

Route	From	To	Peak Hour	No Action Alternative (minutes)	Preferred Alternative (minutes)	Restricted Access Alternatives	
						Alternative 2 (minutes)	Alternative 3 (minutes)
Rainbow Bridge	Folsom-Auburn Road/ Folsom Dam Road	East Natoma Street/ Folsom Dam Road	AM	15.0	17.0	17.0	17.0
			PM	11.5	13.0	13.0	13.0
Rainbow Bridge	East Natoma Street/ Folsom Dam Road	Folsom-Auburn Road/ Folsom Dam Road	AM	12.0	13.0	13.0	13.0
			PM	14.5	16.5	16.5	16.5
Lake Natoma Crossing	Folsom-Auburn Road/ Folsom Dam Road	East Natoma Street/ Folsom Dam Road	AM	15.0	17.0	15.5	15.5
			PM	14.0	16.0	14.5	14.5
Lake Natoma Crossing	East Natoma Street/ Folsom Dam Road	Folsom-Auburn Road/ Folsom Dam Road	AM	13.5	16.5	14.0	14.0
			PM	15.0	16.5	15.5	15.5

Source: Fehr & Peers

**Table 3.1-9
2013 Roadway Segment Levels of Service**

Roadway	Facility Type	No Action Alternative		Preferred Alternative		Restricted Access Alternatives			
		Daily Traffic Volumes (vpd)	LOS	Daily Traffic Volumes (vpd)	LOS	Alternative 2 (5,800 vpd)		Alternative 3 (3,800 vpd)	
						Daily Traffic Volumes (vpd)	LOS	Daily Traffic Volumes (vpd)	LOS
Folsom Dam Road	2-Lane Arterial	15,100	D	-	-	5,800	C ¹	3,800	C ¹
Riley Street Crossing (Rainbow Bridge)	2-Lane Arterial	34,600	F	44,600	F	41,500	F	42,500	F
Folsom Boulevard Crossing (Lake Natoma Crossing)	4-Lane Arterial, Divided	41,800	F	43,200	F	42,800	F	42,900	F
Folsom Boulevard (between Blue Ravine and Iron Point Road)	4-Lane Arterial, Divided	32,500	D	34,200	D	34,200	D	34,200	D
Folsom-Auburn Road (between Folsom Dam Road and Inwood Road)	4-Lane Arterial, Undivided	29,400	F	34,600	F	31,700	F	32,700	F
Folsom-Auburn Road (between Oak Avenue Parkway and Greenback Lane)	4-Lane Arterial, Divided	39,000	F	47,800	F	44,900	F	45,900	F
Natoma Street (between Folsom Boulevard and Sibley Street)	2-Lane Collector	8,500	D	14,300	F	14,300	F	14,300	F
East Natoma Street (between Cimmaron Circle and Folsom Dam Road)	4-Lane Arterial, Undivided	17,800	D	22,800	D	22,800	D	22,800	D
Folsom Dam Bypass (USACE)	2-Lane Arterial	19,600	F	26,700	F	24,500	F	25,200	F

Source: Fehr & Peers

vpd = vehicles per day

Boldface text indicates a change in level of service with respect to the No Action Alternative. If traffic would be added to a roadway already operating at LOS F, the LOS is also shown in bold as this road would be further affected.

¹The LOS is based on service rate of 960 vehicles per hour. LOS assumes the level of service thresholds for daily traffic volumes are 10% of the peak hour traffic (i.e., LOS C for 2-Lane Arterial is 970 vehicles per hour).

Intersection Operations. With projected growth in traffic to 2005 No Action conditions (i.e., changes projected to occur due to growth in traffic with Folsom Dam Road open), the Folsom-Auburn Road/Folsom Dam Road, Folsom-Auburn Road/Greenback Lane, and Riley Street/East Natoma Street intersections would operate below acceptable levels during both the AM and PM peak periods. The East Natoma Street/Folsom Dam Road intersection operated at LOS C under existing conditions during the AM peak hour; it would degrade to LOS D in 2005. The Folsom-Auburn Road/Folsom Dam Road intersection operated at LOS D during the existing AM peak hour but would degrade to LOS F in 2005. The Folsom Boulevard/East Natoma Street intersection operated at LOS B under existing conditions during the PM peak hour; it would operate at LOS D in 2005. In addition, traffic backup from upstream intersections would continue to cause operations to fall below acceptable standards at the Riley Street/Scott Street, Riley Street/Leidesdorff Street, Riley Street/Sutter Street, and East Natoma Street/Coloma Street intersections.

Bicycle and Pedestrian Impacts. Under the No Action Alternative, existing motor vehicle traffic would increase on Natoma Street, Folsom-Auburn Road, and Folsom Boulevard, which provide pedestrian and bicycle facilities. This is noted as an impact with respect to potential pedestrian/bicycle facilities, but no planned existing or planned future facilities will be physically affected.

Transit Impacts. The Sacramento Regional Transit light rail service is expected to be operational in downtown Folsom by 2005. The 2005 bus transit service was assumed to be the same as existing as there are no planned improvements (M. Rackovan, pers. comm., 2004b). Currently, bus service is provided along Riley Street and Folsom-Auburn Road.

Peak hour travel times are expected to increase on Riley Street and Folsom-Auburn Road. In addition, daily traffic levels would increase on the study roadways. Transit providers may need to increase the number of vehicles in their fleets to maintain existing headways.

Accidents. As noted at the end of Section 3.1.1.3 (“Accident Data”), the City of Folsom’s traffic accident data showed an increase in incidents for the year following the closure of Folsom Dam Road, in comparison to the year prior to the closure. The comparison could indicate an association of increased traffic congestion with an increase in accidents in the city. Subsequent periods of data collection and comparison over longer time periods would be needed to verify a sustained trend, but, in general, increases in traffic and congestion can lead to increases in accidents. Traffic congestion has increased in Folsom as it has grown in population and business, and the Folsom Dam Road closure has resulted in a diversion or shift of traffic that has contributed to increased congestion, with effects varying by location. The Preferred Alternative may therefore cumulatively contribute to this effect, assuming long-term collection of accident data shows a sustained increase. Continued growth in the City of Folsom and nearby communities is planned for and expected to continue, and this will also contribute to future trends in accident rates, again, assuming an association between traffic volume increases and accident incidents.

2013 Conditions

Roadway Operations. Growth within and near the City of Folsom would continue to increase traffic and congestion on the area’s roadways through the year 2013. However, the planned transportation improvements will increase capacity and help offset some of the adverse impacts of this growth. Conditions on Folsom Dam Road and the Riley Street crossing will operate

better, and Natoma Street between Folsom Boulevard and Sibley Street will maintain the same volume in 2013 compared to 2005 primarily due to the proposed Folsom Dam Bypass Project, which will carry approximately 20,000 vehicles per day. Volumes are predicted to increase between 2,000 to 6,000 vehicles per day on the other study roads, with largest increase predicted on the Lake Natoma Crossing. All of the roadway segments would continue to operate at a level of service that is below the standard determined by the City of Folsom as acceptable under 2013 No Action conditions. Five of the six study segments are projected to operate at LOS F. All of these changes are due to growth in the area even with the implementation of other transportation improvements (such as the aforementioned Folsom Dam Bypass Project).

Bicycle, Pedestrian, and Transit Impacts. Potential effects to these modes of transportation for all remaining alternatives and all study years would be the same as those described for 2005 conditions.

For any of the study years described above, near-complete access to Folsom Dam Road poses a risk of dam failure under the No Action Alternative. If dam failure occurs, local and regional transportation networks would be impacted. Folsom Dam Road would be closed indefinitely. In addition, other roadways would also be closed.

3.1.2.2 Preferred Alternative

2005 Conditions

Roadway Operations. All of the study roadway segments are projected to operate at levels below LOS C in 2005 with the Preferred Alternative, as is predicted for the other alternatives. The Preferred Alternative would result in an increase in traffic on all roadway segments, with the obvious exception of Folsom Dam Road as it would remain closed. Traffic on three study area roadways (Rainbow Bridge, Lake Natoma Crossing, and Folsom Boulevard between Blue Ravine and Iron Point Roads) would increase but would not result in a change in level of service in comparison to the No Action Alternative. In comparison to the No Action Alternative, the following adverse impacts would occur based on a predicted change in the level of service:

- Traffic on four other segments of Folsom-Auburn Road and Natoma Street would increase enough to change levels of service from D to F, which is a noticeable, adverse impact (see Table 3.1-5).
- Compared to the No Action Alternative, the Preferred Alternative is predicted to increase traffic on the Rainbow Bridge by approximately 10,000 vehicles per day. The bridge is already at LOS F. This impact would further increase delay time at this congested roadway segment.

Intersection Operations. With the Preferred Alternative (in comparison to the No Action Alternative), the two intersections at either end of Folsom Dam Road show improved operations due to the reduction of traffic on one of the intersection legs (i.e., due to Folsom Dam Road being closed). The levels of service change in the AM and PM peak period at the Riley Street/Sutter Street intersection, but even with the change it continues to operate better than the city's LOS C criteria. The analysis indicates that the Riley Street/Scott Street, Riley Street/Leidesdorff Street, Riley Street/Sutter Street, and East Natoma Street/Coloma Street intersections would operate acceptably; however, traffic backup from adjacent intersections could cause higher delays. The following adverse impacts are identified:

- The Folsom-Auburn Road/Oak Avenue Parkway would degrade from LOS D to E in the PM peak period.
- Folsom-Auburn Road/Greenback Lane operations (already at LOS F) worsen with the Preferred Alternative because the Folsom Dam Road closure increases traffic along Folsom-Auburn Road and Folsom Boulevard.
- The Riley Street/East Natoma Street intersection would degrade from LOS D/E to LOS F.
- The Folsom Boulevard/Natoma Street intersection would degrade from LOS C to D during the AM peak hour.

Vehicle Miles Traveled and Travel Times. Accounting for the SACMET model’s accuracy and rounding the results accordingly, the model estimated that the total daily vehicle miles traveled within the study area would generally be the same with and without the Folsom Dam Road closure². However, the Preferred Alternative would increase the vehicle hours traveled by approximately 1 percent and the vehicle hours of delay by approximately 7 percent.

	No Action	Preferred Alternative
Vehicle Miles Traveled	2,340,000	2,340,000
Vehicle Hours Traveled	70,700	71,500
Vehicle Hours of Delay	12,200	13,100

In Section 3.1.2, three representative routes were defined that were modeled to forecast the total travel time for the different routes between the Folsom-Auburn Road/Folsom Boulevard and East Natoma Street/Folsom Dam Road intersections. Table 3.1-4 shows 2005 peak hour travel times for the No Action Alternative and Preferred Alternative for each of those routes. As shown in the table, travel times on Route 1 are the same as for the No Action Alternative. However, peak hour travel times would increase on Route 2 (1 minute in the AM peak and 3 minutes in the PM peak), Route 3 (5 minutes in the AM peak and 3.5 minutes in the PM peak), and Route 4 (4 minutes in both the AM and PM peaks).

2013 Conditions

Roadway Operations. Relative to the No Action Alternative, traffic volumes on roadways within the study area would further increase with the Preferred Alternative. Although the Folsom Dam Bypass is assumed to be completed by 2007/2008, projected growth to 2013 continues to increase on all roadway segments. As noted above, a total of five roadway segments are already projected to operate at LOS F with the No Action Alternative. One more roadway, Natoma Street between Cimmaron Circle and Folsom Dam Road, would drop from LOS D to F with Folsom Dam Road closed. The Folsom Dam Road closure would increase traffic on the Rainbow Bridge, Lake Natoma Crossing, and Folsom Dam Bypass by approximately 18,000 vehicles per day. In addition, traffic volumes on East Natoma Street and on Folsom-Auburn Road between

² The model showed a difference in vehicle miles traveled of less than 200 miles daily total for the entire study area (the Preferred Alternative miles traveled were greater than the No Action Alternative). Accounting for assumptions in the study, the model accuracy, and rounding of predicted results, the difference is negligible and is considered the same for alternatives in the 2005 study year.

Folsom Dam Road and Inwood Road would increase by approximately 5,000 vehicles per day. The following adverse impacts would occur:

- The level of service on East Natoma Street between Cimmaron Circle and Folsom Dam Road would decline from LOS D to F.
- Five roadways already operating at LOS F would be adversely affected by additional traffic diverted to them, compared to the No Action Alternative.

Vehicle Miles Traveled and Travel Times. The SACMET model estimated that the daily vehicle miles traveled within the study area would be 6 percent higher under the No Action Alternative than under the Preferred Alternative.

	No Action	Preferred Alternative
Vehicle Miles Traveled	3,270,000	3,250,000
Vehicle Hours Traveled	100,100	100,500
Vehicle Hours of Delay	17,600	18,500

Vehicle hours traveled for the study area would be nearly equal without and with the Folsom Dam Road closure. This is partly due to the addition of the Folsom Dam Bypass. However, the Preferred Alternative would increase the vehicle hours of travel by approximately 5 percent.

Table 3.1-8 shows 2013 peak hour travel times for the No Action Alternative and Preferred Alternative. As shown in the table, peak hour travel times for the Preferred Alternative would increase on all four routes by approximately 1 to 3 minutes.

3.1.2.3 Restricted Access Alternatives 2 and 3

Restricted Access Alternative 2 – 2005 Conditions

Roadway Operations. As described in Section 2.2.3, this alternative allows restricted access for inspected vehicles across Folsom Dam Road. Based on the definition of Restricted Access Alternative 2 used for this analysis, Folsom Dam Road would have restricted hours of use, and vehicles would be subject to inspection. As a result, Folsom Dam Road under this scenario is estimated to carry 5,800 vehicles per day assuming that the level of inspection service can be achieved and maintained. Based on vehicle counts, the capacity of the two-lane unrestricted Folsom Dam Road is estimated at 950 vehicles per hour per lane or a total of 1,900 vehicles per hour for two lanes. As discussed in Section 2.2.3, with an average 30-second delay per vehicle for inspections, 120 cars per hour per lane can be achieved in one direction. Meeting the pre-closure capacity would require either eight inspection lanes or an increased inspection rate by another method that achieves the same traffic flow rate. The following differences in impacts are identified:

- Compared with the No Action Alternative, traffic on one segment of Folsom-Auburn Road and two segments of Natoma Street would degrade from D to F. All other levels of service would be approximately the same in comparison to the No Action Alternative. Compared to the Preferred Alternative, Restricted Access Alternative 2 would result in LOS decreases at all but one of the same roadway segments (Folsom-Auburn Road between Folsom Dam Road and Inwood Road).

- Compared to No Action, under Restricted Access Alternative 2, traffic on Rainbow Bridge would increase by approximately 4,000 vehicles per day.

Intersection Operations. The forecasts indicate that intersection levels of service for Restricted Access Alternative 2 would continue to operate at acceptable levels and would be the same as under the No Action Alternative (i.e., no adverse impact) at the Riley Street/Scott Street, Riley Street/Leidesdorff Street, Riley Street/Sutter Street, and East Natoma Street/Coloma Street intersections. Restricted Access Alternative 2 would also allow sufficient traffic to cross Folsom Dam Road that the level of service at the intersection of Folsom Boulevard/Natoma Street would not degrade below LOS C (same as under No Action). Operations at the Folsom-Auburn Road/Folsom Dam Road and East Natoma Street/Folsom Dam Road intersections would improve slightly with Restricted Access Alternative 2 due to the limited flow of traffic on Folsom Dam Road but would still operate at poor levels of service (LOS E and F) (a beneficial impact with respect to the No Action Alternative). The following adverse impacts would occur with respect to the No Action Alternative:

- The Folsom-Auburn Road/Oak Avenue Parkway and Riley Street/East Natoma intersection level of service operations would worsen.
- Traffic would increase at the Folsom-Auburn Road/Greenback Lane intersection, which is already functioning at LOS F.

Travel Times. Table 3.1-4 shows 2005 peak hour travel times for the No Action Alternative and Restricted Access Alternative 2. As shown in the table, travel times on study Routes 1 and 3 would be the same as for the No Action Alternative. However, peak hour travel times would increase on Route 2 (1 minute in both the AM and PM peaks) and Route 4 (30 seconds in the PM peak only).

Restricted Access Alternative 2 – 2013 Conditions

Roadway Operations. Traffic would increase on all study roadways in 2013 except for Folsom Dam Road but would only degrade level of service operations in one segment. As compared to No Action, traffic on Rainbow Bridge, the Lake Natoma Crossing, and the Folsom Dam Bypass would increase by a total of approximately 13,000 vehicles per day. The following adverse impacts would occur:

- Almost all roadway segments would already operate at LOS F. Volumes would increase on all roadway segments. The level of service on Natoma Street between Folsom Boulevard and Sibley Street would decline from LOS D to F. This is the same as the Preferred Alternative.
- Five roadways already operating at LOS F would be adversely affected by additional traffic diverted to them, in comparison to the No Action Alternative.

Travel Times. Table 3.1-8 shows 2013 peak hour travel times for the No Action Alternative and Restricted Access Alternative 2. As shown in the table, peak hour travel times for Alternative 2 would increase on all four routes by approximately 30 seconds to 2 minutes.

Restricted Access Alternative 3 – 2005 Conditions

Roadway Operations. Similar to Restricted Access Alternative 2, this alternative would allow restricted access across Folsom Dam Road, but at a lower service rate than Alternative 2, as it assumed that less inspection capacity is available at each end of Folsom Dam Road and vehicle flow would be allowed in one direction only (changing between AM and PM peak periods). Folsom Dam Road would carry an estimated 3,800 vehicles per day (500 vehicles per hour), again assuming the proposed inspection rates can be achieved and maintained (as described in Section 2.2.3). This alternative would allow for 2,000 fewer vehicles per day than Restricted Access Alternative 2 (i.e., 5,800 minus 3,800). Five hundred vehicles per hour is about half of the pre-closure one-way capacity of each lane. At an average inspection rate of 30 seconds per vehicle, achieving this volume would require either four inspection lanes or an equivalent method that provides the same rate of traffic flow. Vehicles using Folsom Dam Road would be diverted from other roadways in the area, improving their operations, but the diversion is less effective in general than Restricted Access Alternative 2. Under Restricted Access Alternative 3, all roadway segments in the study area except Folsom Dam Road would have service levels below LOS C and higher daily traffic volumes than the No Action Alternative. The following adverse impacts are identified:

- Traffic on one segment of Folsom-Auburn Road and two segments of Natoma Street would degrade from LOS D to F. One roadway segment, Folsom-Auburn Road between Folsom Dam Road and Inwood Road, would operate at LOS E in comparison to LOS D with the No Action Alternative.
- Restricted Access Alternative 3 would add more than 5,000 vehicles per day to the Rainbow Bridge as compared to the No Action Alternative.

Intersection Operations. A lower volume of cars would be inspected under Restricted Access Alternative 3 than under Alternative 2, but the resulting level of service changes are the same except for one intersection (Folsom Boulevard/Natoma Street in the AM peak period). Compared with the No Action Alternative, the following adverse impacts would occur:

- The Folsom-Auburn Road/Oak Avenue Parkway and Riley Street/East Natoma intersection level of service operations would worsen because traffic would increase along Folsom-Auburn Road and Folsom Boulevard.
- Traffic would increase at the Folsom-Auburn Road/Greenback Lane intersection, which is already functioning at LOS F (same as the No Action Alternative, but traffic volumes using the intersection would be slightly higher).
- The Folsom Boulevard/Natoma Street intersection would decline from LOS C to D in the AM peak hour.

Travel Times. Table 3.1-4 shows 2005 peak hour travel times for the No Action Alternative and Restricted Access Alternative 3. As shown in the table, travel times on Routes 1 and 3 would be the same as under the No Action Alternative. However, peak hour travel times would increase on Route 2 (1.5 minutes in both the AM and PM peaks) and Route 4 (30 seconds in the PM peak only).

Restricted Access Alternative 3 – 2013 Conditions

Roadway Operations. Under Restricted Access Alternative 3, all of the roadway segments except Folsom Dam Road would operate at service levels below the acceptable standard, according to the City of Folsom General Plan. As compared to No Action, traffic on Rainbow Bridge, the Lake Natoma Crossing, and the Folsom Dam Bypass would increase by approximately 15,000 vehicles per day. The following adverse impacts are identified:

- Compared to No Action, the level of service on Natoma Street between Folsom Boulevard and Sibley Street would decline from LOS D to F.
- Volumes on all study roadways except Folsom Dam Road would be higher than with the No Action Alternative, but not enough to degrade the level of service.

Travel Times. Table 3.1-8 shows 2013 peak hour travel times for the No Action Alternative and Restricted Access Alternative 3. As shown in the table, peak hour travel times for Alternative 3 would increase on all four routes by approximately 30 seconds to 2 minutes.

Accidents. Both of the Restricted Access Alternatives would also have an increase in traffic and congestion conditions in comparison the No Action Alternative, but less than with the Preferred Alternative. As discussed for the Preferred Alternative, assuming that Folsom's recorded increase in accident rates following the road closure is directly associated with the closure, some increase in accidents might also occur with either of the Restricted Access Alternatives. It is not possible to predict whether there would be any difference between the Preferred Alternative and Restricted Access Alternatives in terms of citywide accident rates.

3.1.3 Mitigation

The transportation impact analysis identifies impacts to the roadway, transit, travel time, pedestrian, and bicycle components of the transportation system within the study area. Mitigation measures for each horizon year (2005 and 2013) are discussed in this section. Where potential adverse impacts may occur under the Preferred Alternative and Restricted Access Alternatives 2 and 3, possible mitigation is identified for ways to reduce the degradation to service levels.

3.1.3.1 No Action Alternative

With respect to LOS reductions in study area roadway and intersection operations in 2005 and 2013, no mitigation applies. The No Action Alternative exposes the dam to unacceptable risks of potential failure, which would have substantial short- and long-term transportation impacts. These potential impacts are discussed in Appendix D. At this time, no mitigation for impacts associated with potential dam failure is identified, other than further avoidance or reduction of the risk.

3.1.3.2 Preferred Alternative

Roadway Capacity Improvements. All of the study roadways would operate below (worse than) LOS C in 2005 and 2013. Compared to the No Action Alternative, the Preferred Alternative would not cause any new roadway segments to operate at a level below the standard established by the City of Folsom's General Plan, but it would add traffic to roadway segments that operate at LOS D, E, or F under No Action. These segments are as follows:

- Riley Street crossing (Rainbow Bridge)
- Folsom Boulevard crossing (Lake Natoma Crossing)
- Folsom Boulevard between Blue Ravine Road and Iron Point Road
- Folsom-Auburn Road, between Folsom Dam Road and Inwood Road
- Folsom-Auburn Road, between Oak Avenue Parkway and Greenback Lane
- Natoma Street, between Folsom Boulevard and Sibley Street
- East Natoma Street, between Cimmaron Circle and Folsom Dam Road

Mitigation Measures Beyond Authority of Reclamation. These local roadways approach or exceed capacity under the No Action Alternative. One method to improve roadway segment operations is to add capacity by adding lanes. Adding lanes can require right-of-way acquisition and modification/relocation of adjacent buildings. Future planned improvements on East Natoma Street between Cimmaron Circle and Folsom Dam Road include the construction of an additional lane in each direction. With this improvement, this roadway segment would operate at LOS D. However, the widening would not add sufficient capacity to improve operations to acceptable levels. All of the other roadway segments cannot be widened without disruption to adjacent businesses. In addition, right-of-way is not available along the east side of Folsom-Auburn Road and Folsom Boulevard due to the construction of the Sacramento Regional Transit Light Rail Extension.

Roadway operations can also be improved by reducing traffic volumes by changing people's travel modes (e.g., transit or bicycle) or promoting ridesharing (using carpools or vanpools). Increasing existing and future transit service both in frequency and coverage and giving preferential treatment to transit service, such as signal priority or exclusive lanes, would improve transit performance and reduce transit travel times. Substantial improvements to transit performance have been found to entice people from automobiles, thus reducing traffic volumes.

Mitigation Measures Within Authority of Reclamation. Another option is to open Folsom Dam Road to transit and carpools only. Such measures would result in restricting the number of vehicles that cross Folsom Dam Road and are represented by Restricted Access Alternatives 2 and 3. The improved travel times would entice people to shift modes from single-occupant automobiles to buses or carpools, which would provide more than a one-to-one vehicle reduction. (Each vehicle on Folsom Dam Road would result in more than one vehicle being diverted from other roadways). However, security and inspection requirements would still apply to any vehicle using Folsom Dam Road.

Intersection Capacity Improvements. Compared with 2005 No Action conditions (see Table 3.1-6), the intersections discussed below would either have decreased levels of service or increased delay at an intersection already operating at LOS F.

Mitigation Measures Beyond Authority of Reclamation. The following capacity improvements could be made at these intersections:

- Folsom-Auburn Road/Oak Avenue Parkway – During the peak PM hour, this intersection would operate at LOS D under No Action conditions and LOS E with the Preferred Alternative. The addition of an eastbound right-turn lane would improve the operations at this intersection; however, this would require the installation of a retaining wall and other

earthwork due to the steep slope on Oak Avenue Parkway. With this improvement, this intersection would operate at LOS D during the AM peak hour and LOS E during the PM peak hour.

- Folsom-Auburn Road/Greenback Lane – This intersection would operate at LOS F during the AM and PM peak hours under both the No Action Alternative and Preferred Alternative. The intersection is essentially “built out.” Grade separation or other major physical changes would be needed to improve operations to acceptable levels. There is no feasible mitigation to improve operations at this intersection.
- Riley Street/East Natoma Street – Under No Action conditions, this intersection would operate at LOS D and E in the AM and PM peak hours, respectively. With the Preferred Alternative, it would operate at LOS F in both the AM and PM peak hours. Poor operations at this intersection are due to congestion throughout the Riley Street corridor. Systemwide improvements along Riley Street, such as added through lanes that are not feasible, would be needed to improve operations to acceptable levels.
- Folsom Boulevard/Natoma Street – Under No Action conditions, this intersection would operate at LOS C and D in the AM and PM peak hours, respectively. With the Preferred Alternative, it would operate at LOS D in both the AM and PM peak hours. The addition of a third southbound through lane would improve the operations at this intersection; however, right-of-way acquisition would most likely be required. With this improvement, this intersection would operate at LOS C during the AM peak hour and LOS D during the PM peak hour.

In addition, intersection operations can be improved through signal coordination and timing optimization. To support this effort, Reclamation could conduct traffic counts to measure turning movement volumes at the intersections on the affected roadways and develop optimized signal timing plans for implementation by the appropriate agencies.

3.1.3.3 *Restricted Access Alternatives 2 and 3*

Roadway Capacity Improvements. As compared to No Action, roadway LOS operations would be the same in 2005 and 2013 for the Restricted Access Alternatives and the Preferred Alternative except for one roadway segment. In 2005, Folsom-Auburn Road between Folsom Dam Road and Inwood Road is predicted to operate at LOS D under No Action and Alternative 2 and LOS E under Alternative 3, compared to LOS F under the Preferred Alternative. However, the same mitigation described for the Preferred Alternative would apply.

Intersection Capacity Improvements. Compared to 2005 No Action conditions (see Table 3.1-6), Restricted Access Alternatives 2 and 3 would decrease levels of service or increase delay at the same four intersections as the Preferred Alternative. At the Riley Street/East Natoma Street intersection, levels of service would decline slightly less than under the Preferred Alternative in the AM peak hour (LOS E for Alternatives 2 and 3 compared to LOS F). However, mitigation would be the same as that described for the Preferred Alternative.

3.2.1 Affected Environment

This section describes the affected environment of Eastern Sacramento County with respect to air quality. It also includes descriptions of Federal, State, and regional regulations that apply to air quality in the Folsom area and regional compliance with established air quality standards.

3.2.1.1 Air Quality Study Area

The project area consists of the portion of Folsom Dam Road that has been closed for security purposes, and local and regional roads affected by traffic changes since the closure. Motor vehicles are a source of air pollutant emissions in the project area and are the focus of this evaluation. The project area is under the jurisdiction of the Sacramento Metropolitan Air Quality Management District (SMAQMD), which covers Sacramento County only.

3.2.1.2 Environmental Setting

Folsom lies in the eastern portion of the Sacramento Valley air basin at the base of the Sierra Nevada foothills. This section describes the regional climate and meteorological conditions that influence the transport and dispersion of air pollutants and air quality in the project area.

Meteorology and Climatology

Prevailing winds in Sacramento County come from the south, primarily because of marine breezes that originate from the west and are driven northward by local topography. During the winter, these sea breezes usually diminish and winds from the north occur with greater frequency. Nevertheless, winds from the south predominate.

In addition to wind flow, atmospheric stability and mixing heights are important parameters in the determination of pollutant dispersion. Atmospheric stability reflects the amount of atmospheric turbulence and mixing. In general, the less stable an atmosphere, the greater the turbulence, resulting in more mixing and better dispersion. The mixing height, measured from the ground upward, is the height of the atmospheric layer in which convection and mechanical turbulence promote mixing. Good “ventilation” results from a high mixing height and at least moderate wind speeds within the mixing layer.

Between late spring and early fall, a layer of warm air often overlays a layer of cool air, resulting in frequent temperature inversions. Winter inversions are usually formed when the sun heats upper air layers, trapping the lower layers that are cooled by contact with the surface of the earth during the night. Although inversion types predominate during certain times of the year, either type could occur at any time. Temperature inversions limit mixing heights and thus are associated with poor dispersion. Local topography produces a number of variations that can affect the inversion base and influence local air quality.

Normal maximum and minimum temperatures (in degrees Fahrenheit) during the summer vary generally from the low 90s to the high 50s, respectively (Table 3.2-1). During the winter, maximum temperatures vary from the high 30s to the low 60s.

**Table 3.2-1
Average Climatological Data at Folsom Dam**

Month	Temperature (°F)			Precipitation (inches)	
	Normal Max	Normal Min	Normal	Normal	Median
January	53.4	37.7	45.6	4.33	3.85
February	60.0	41.6	50.9	3.45	2.35
March	63.7	43.9	53.8	3.82	3.48
April	70.2	46.6	58.5	1.89	1.23
May	79.3	51.1	65.2	0.49	0.25
June	87.6	56.7	72.1	0.2	0.11
July	94.2	60.2	77.2	0.11	0.00
August	93.2	59.8	76.5	0.12	0.00
September	87.6	57.4	72.5	0.48	0.10
October	77.8	52.6	65.3	1.55	0.94
November	63.3	44.9	54.2	3.95	2.83
December	54	38.5	46.3	3.47	3.10
Year	73.7	49.2	61.5	23.91	22.10

Source: NOAA 1992

The average annual precipitation at Folsom Dam is 23.91 inches. January is the wettest month with an average of 4.33 inches of precipitation, and July and August are the driest months, with no measurable rainfall. Monthly temperature and precipitation data collected at Folsom Dam are summarized in Table 3.2-1.

Existing Pollution Sources

The California Air Resources Board (CARB) maintains an inventory of point, areawide, and mobile sources within the Sacramento area. Point sources include industrial plants and refineries. Area sources include small sources such as dry cleaners, gas stations, and paint and solvent use. Mobile sources include on-road and off-road vehicles and marine sources. The 2003 emission inventory for the Sacramento Valley Air Basin is summarized in Table 3.2-2.

**Table 3.2-2
2003 Estimated Annual Average Emissions Sacramento Valley Air Basin (Tons)**

Source Type	Total Organic Gases	Reactive Organic Gases	Carbon Monoxide	Nitrogen Oxides	Sulfur Oxides	Particulate Matter	PM ₁₀	PM _{2.5}
Stationary Sources								
Fuel Combustion	11.6	2.7	35.5	33.4	1.1	3.7	3.5	3.4
Waste Disposal	34.7	0.5	0.2	0.1	0	0.1	0	0
Cleaning and Surface Coatings	18.4	15.5	0.6	0.1	0	0	0	0
Petroleum Production and Marketing	71	14	0.5	2.3	0	0	0	0
Industrial Process	6.4	5.1	11.5	3	0.4	25	13.5	7.7
Total	142.1	37.8	48.4	38.8	1.5	28.8	17.1	10.6
Areawide Sources								
Solvent Evaporation	41.7	38	NA	NA	NA	NA	NA	NA
Miscellaneous Processes	139.8	29.3	332.8	8.2	0.8	362.7	201	70.8
Total	181.5	67.2	332.8	8.2	0.8	362.8	201	70.9
Mobile Sources								
On-Road Motor Vehicles	75.9	70.4	661.6	127	1	3.7	3.6	2.6
Other Mobile Sources	49.1	45.3	276.7	92.2	2.7	6.2	6.1	5.4
Total	125.1	115.7	938.3	219.3	3.6	9.9	9.7	7.9

Source: CARB Web site (www.arb.ca.gov)

NA = Not applicable

3.2.1.3 Regulatory Setting

The project area is subject to major air quality planning programs required by both the Federal Clean Air Act, which was last amended in 1990 (42 U.S. Code [USC] 7401 et seq.), and the California Clean Air Act of 1988 (California Health and Safety Code Section 39600 et seq.). Both the Federal and State statutes provide for ambient air quality standards to protect public health, timetables for achieving and maintaining ambient standards, and the development of Federal- and State-mandated plans to guide the air quality improvement efforts of State and local agencies. The Federal plan, which is referred to as the State Implementation Plan (SIP), must contain control strategies that demonstrate attainment with national ambient air quality standards by deadlines established in the Federal Clean Air Act. The State plan is called the Clean Air Plan (CAP). The CAP must show satisfactory progress in attaining State ambient air quality standards. Deadlines for attaining State standards are not fixed. The SIP and the CAP overlap and generally contain the same emissions control measures.

Both the SIP and the CAP rely on the combined emission control programs of the U.S. Environmental Protection Agency (USEPA), the CARB, and the SMAQMD. The role of each agency in controlling emissions in the project area is described below.

Federal

The USEPA oversees State and local implementation of Federal Clean Air Act requirements. It sets emission standards for many mobile sources such as new on-road motor vehicles, including transport trucks that are sold outside of California. The USEPA also sets emission standards for

various classes of new off-road mobile sources, including locomotives that are sold throughout the country.

State and Local

Although the Folsom Dam Road access restrictions being considered are a Federal action, State and local laws and regulations are important to understand as they regulate regional air quality. Under California law, the responsibility for carrying out air pollution control programs is split between the CARB and local or regional air pollution control agencies. In the project area, the SMAQMD regulates stationary sources. The SMAQMD can impose emission standards, set fuel or material specifications, establish operational limits to reduce air emissions, and require stationary sources to obtain permits.

The CARB shares the regulation of mobile sources with the USEPA. The CARB has the authority to set emission standards for on-road motor vehicles and for some classes of off-road mobile sources that are sold in California. The emission standards with the largest effect in the project area are those set for automobile, light- and medium-duty truck, California heavy-duty truck, and other diesel engines. The CARB also regulates vehicle fuels with the intent to reduce emissions. The CARB has set emission reduction performance requirements for gasoline (California reformulated gasoline) and has limited the sulfur and aromatic content of diesel fuel to make it burn cleaner. The CARB also sets the standards used to pass or fail vehicles in the smog check and heavy-duty truck inspection programs.

The Federal, State, and regional control programs described above are directed primarily toward criteria pollutants. Criteria pollutants are those for which ambient air quality standards exist. Programs are also in place to reduce public exposure to other pollutants, such as those that present a potential hazard to public health. These pollutants are called “hazardous air pollutants” in Federal law and “toxic air contaminants” under California law. Toxic air contaminants are pollutants for which specific air quality standards have not been established but that are capable of causing short-term (acute) and/or long-term (chronic or carcinogenic) adverse human health effects. The Federal and State programs are currently directed toward reducing toxic air contaminant emissions. Although hazardous air pollutants have no ambient standards, SMAQMD regulates new or expanding stationary sources of these pollutants.

National and State Ambient Air Quality Standards

National and State ambient air quality standards have been established for carbon monoxide (CO), ozone (O₃), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), and particulate matter less than 10 and 2.5 micrometers in diameter (PM₁₀ and PM_{2.5}, respectively).¹ Ambient standards specify the concentration of these “criteria pollutants” that the public can be exposed to without experiencing adverse health effects. Since individuals vary widely in their sensitivity to air pollutants, standards are set to protect more sensitive populations (i.e., children and the elderly). National and State standards are reviewed and updated periodically based on new health studies. California ambient standards tend to be at least as protective as national ambient standards and are often more stringent. National and State ambient air quality standards are listed in Table 3.2-3.

¹ Other pollutants (e.g., lead) also have ambient standards, but they are not discussed in this document because emissions of these pollutants from cars and vessels are expected to be minimal.

**Table 3.2-3
State and Federal Ambient Air Quality Standards**

Pollutant	Averaging Time	California Standards ¹	National Standards ^{2,3}	Sacramento State Status/Classification	Sacramento National Status/Classification
Ozone	8 hour	--	0.08 ppm	--	Nonattainment
	1 hour	0.09 ppm	0.12 ppm	Nonattainment	Nonattainment
Carbon Monoxide	8 hour	9.0 ppm	9 ppm	Attainment	Attainment
	1 hour	20 ppm	35 ppm	Attainment	Attainment
Nitrogen Dioxide	Annual Mean	--	0.053 ppm	--	Attainment
	1 hour	0.25 ppm	--	Attainment	--
Sulfur Dioxide	Annual Mean	--	0.03 ppm	--	Attainment
	24 hour	0.04 ppm	0.14 ppm	Attainment	Attainment
	1 hour	0.25 ppm	--	Attainment	--
Fine Particulate Matter (PM ₁₀)	Annual Arithmetic Mean	--	50 µg/m ³	--	Attainment
	Annual Geometric Mean	30 µg/m ³	--	Nonattainment	--
	24 hour	50 µg/m ³	150 µg/m ³	Nonattainment	Nonattainment
Fine Particulate Matter (PM _{2.5})	Annual Arithmetic Mean	--	15 µg/m ³	--	Unclassified/Not Designated
	24 hour	--	65 µg/m ³	--	Unclassified/Not Designated

1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, suspended particulate matter – PM₁₀, and visibility reducing particles are values that are not to be exceeded. The standards for sulfates, lead, hydrogen sulfide, and vinyl chloride are not to be equaled or exceeded. If the standard is for a 1-hour, 8-hour or 24-hour average (i.e., all standards except for lead and the PM₁₀ annual standard), then some measurements may be excluded. In particular, measurements are excluded that CARB determines would occur less than once per year on the average.

2. National standards other than for ozone, particulates, and those based on annual averages are not to be exceeded more than once a year. The 1-hour ozone standard is attained if, during the most recent three-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than one. The 8-hour ozone standard is attained when the 3-year average of the 4th highest daily concentrations is 0.08 ppm or less. The 24-hour PM₁₀ standard is attained when the 3-year average of each year's annual 99th percentile of monitored concentrations is less than 150 µg/m³. The 24-hour PM_{2.5} standard is attained when the 3-year average of each year's annual 98th percentile is less than 65 µg/m³. Except for the national particulate standards, annual standards are met if the annual average falls below the standard at every site. The national annual particulate standard for PM₁₀ is met if the 3-year average falls below the standard at every site. The annual PM_{2.5} standard is met if the 3-year average of annual averages spatially averaged across officially designed clusters of sites falls below the standard.

3. National air quality standards are set at levels determined to be protective of public health with an adequate margin of safety. Each state must attain these standards no later than three years after that state's implementation plan is approved by the Environmental Protection Agency.

ppm = part(s) per million

µg/m³ = microgram(s) per cubic meter

For planning purposes, regions such as the area under SMAQMD jurisdiction are given an air quality status label by the Federal and State regulatory agencies. Areas with monitored pollutant concentrations that are lower than ambient air quality standards are designated as “attainment areas” on a pollutant-by-pollutant basis. When monitored concentrations exceed ambient standards, areas are designated as “nonattainment areas.” An area that recently exceeded ambient standards but is now in attainment is an attainment area that is referred to as a “maintenance area.” Nonattainment areas are further classified based on the severity and persistence of the air quality problem as “moderate,” “severe,” or “serious.” Classifications determine the applicability and minimum stringency of pollution control requirements. In general, the more serious the air quality classification, the more stringent are the control requirements that must be contained in the regional air quality plans (see discussion of the SIP and CAP, above). The air district is a nonattainment area for O₃ and particulate matter (PM₁₀ only; the area is unclassified for PM_{2.5}) (Table 3.2-3).

3.2.2 Environmental Consequences

This section evaluates the potential impacts to air quality from the proposed action.

Evaluation Criteria

The Folsom Dam Road Access Restriction alternatives will affect traffic patterns in the local and regional area of Folsom, and changes in traffic can affect local and regional air quality. The objective of the air quality assessment for the Folsom Dam Road Access Restriction was first to estimate the potential type of change in air quality emissions for each of the alternatives (that is, to determine whether an alternative might have an overall benefit or adverse impact on air quality based on the anticipated change in traffic conditions). As explained below, overall emissions from traffic volumes were addressed using total daily vehicle miles traveled and average speed. “Tailpipe emissions” of pollutants vary with each of these measures. For example, vehicles are less efficient at very slow speeds, especially stop-and-go conditions. More importantly, higher volumes of cars, miles traveled, and increases in time of delays due to congestion can also result in greater emissions of vehicular-associated pollutant emissions. Traffic growth in each of the study years evaluated was accounted for in the traffic model based on local land use planning projections (General Plans).

The second step evaluated the net effect of each alternative and compared the effect to applicable standards. As described in previous sections, a region’s air quality is measured and assessed already by the regional air quality district (SMAQMD) and Federal and State agencies in terms of whether it is in attainment of established Federal and State criteria. The evaluation for regional impacts focused on whether the predicted changes in traffic patterns could adversely and/or substantially impair the region’s ability to maintain or achieve conformance with established air quality standards for the different criteria pollutants. “Emission budgets” have been developed as part of federally required implementation plans for each region and pollutants of concern (see “Transportation Planning and Regional Air Quality Conformity,” below). An alternative could cause an increase in overall pollutants emitted because of the estimated change in traffic patterns, and the net or total emissions were compared to the regional implementation plan budget surplus for a given pollutant. In addition, SCAQMD has developed criteria for ozone precursors (i.e., reactive organic gases [ROG] and nitrogen oxides [NO_x]). These are criteria that the air district has established to measure whether a project will emit sufficient levels of pollutants to be of

concern on a regional basis. Typically, these criteria might be applied against a proposed “point source” such as a new industrial facility, or a land use development proposal, to determine whether the project could generate quantities of pollutants of concern that should be further evaluated, regulated, or mitigated. The SCAQMD criteria for ROG and NO_x are 65 and 85 pounds per day, respectively. The net emission changes for the alternatives were compared against the SCAQMD criteria.

The evaluation described above is appropriate at a regional level of assessment, within or across a regional air basin. Certain pollutants are of greatest concern on a regional basis because they affect the formation of conditions such as smog, which is formed by a photochemical reaction in the atmosphere when these pollutants are mixed together and exposed to sunlight. These pollutants include NO_x and ROG emissions, which can react and form O₃. Because the formation of O₃ takes place over time and includes sources throughout a regional area, the amount of emissions and their differences among alternatives provide a reasonable means of comparing pollutant emission impacts. In contrast, CO is a pollutant that is of most concern nearest to its primary source of emission (traffic). It tends to disperse rapidly with distance from its source, and therefore CO impacts are more localized, typically nearest areas of greatest traffic or congestion. Because of this difference, potential CO impacts were modeled to predict concentrations at some representative worst-case intersection areas. The modeled concentration levels were added to CO background levels and compared to National and State air quality standards, which are expressed in units of concentration over time (i.e., there are both 1-hour and 8-hour exposure standards for CO, both of which are addressed in this study).

Transportation Planning and Regional Air Quality Conformity

Planning for new or proposed transportation projects includes a process where a regional or local Metropolitan Planning Organization, in this case the SACOG, reviews and prioritizes freeway, highway, roadway, bicycle, and mass transit improvements based on local agency input. Included in this process is a required Air Quality Conformity Analysis that evaluates future traffic and air quality impacts potentially associated with implementing the transportation improvements. The process is repeated every two years with changes and updates in transportation funding and priorities. Although the proposed alternatives for restricted access at Folsom Dam Road are not considered transportation improvements under the Federal transportation funding process and are therefore not evaluated by SACOG, the air quality conformity evaluation process does provide a context for assessing the effects of the road closure options.

SACOG performed its most recent air quality conformity analysis on its Metropolitan Transportation Plan (MTP) for the future year 2025, and Amendment 03-01 to the 2003/2005 Metropolitan Transportation Improvement Program (MTIP) (SACOG 2002b). Analyses were performed for what are termed the Sacramento O₃ Nonattainment Area, CO Attainment Area, and PM₁₀ Planning Areas and the Yuba/Sutter O₃ Nonattainment Area. Except for CO, the designations indicate these areas do not “conform” or meet Federal standards established for those pollutants (described in Section 3.2.1.3). In the case of CO, it is in attainment of current standards but is considered a maintenance area. Until the maintenance status is lifted, CO will be included in the MTIP. Attainment status of PM_{2.5} has not been finalized. However, draft information shows California as nonattainment for that pollutant. Because of the status of these pollutants, emission budgets have been developed as part of a required SIP for the Sacramento O₃ Nonattainment Area, the CO Attainment Area, and for PM₁₀ to help reduce the levels of these

pollutants in future years within the regional area.² For purposes of evaluation of the Folsom Dam Road access restriction alternatives, a comparison was made of the total estimated emissions from each alternative against the emission “budget” identified in the SIP (see Table 3.2-4) for each of the pollutants discussed above. Emission estimates for an alternative that would impact a budget surplus for a pollutant that does not or may not meet attainment status was also used in the following sections to compare regional air quality impacts.

**Table 3.2-4
MTP and MTIP Emission Budget Tests**

Pollutant	Emissions (tons/day)	Budget (tons/day)	Surplus/Deficit (tons/day)
2002			
ROG	32.29	39.67	7.38
NO _x	67.44	70.25	2.81
CO	NA ¹	NA ¹	NA ¹
2005			
ROG	24.65	31.32	6.67
NO _x	54.26	61.35	7.09
CO	222.1	780	557.9
2015			
ROG	15.59	31.32	15.73
NO _x	38.89	61.35	22.46
CO	168.81	780	611.19

Notes: Data for PM₁₀ are not available.

¹SACOG 2002b

Impact Assessment Methodology

Regional Emission Analysis for Criteria Pollutants. The air quality study addresses impacts from vehicle emissions sources for the No Action Alternative, the Preferred Alternative, and Restricted Access Alternatives 2 and 3. The No Action Alternative assumes that Folsom Dam Road will be reopened with any restrictions that were in place pre-February 2003, and the Preferred Alternative assumes that Folsom Dam Road will remain closed. The Restricted Access Alternatives assume that there would be controlled use of the road, which would limit the amount of traffic flow. Current traffic modeling was available for No Action and the Preferred Alternative but not for the Restricted Access Alternatives. Results were qualitatively

² In regard to O₃ and regional air quality planning, O₃ control measures in addition to those defined in the 1994 SIP may be required within the air district to reduce emission sources associated with this pollutant. The region’s compliance for the emission of O₃ precursors may also be affected by updates in the regional emissions inventory. Noncompliance can result in postponement or delays in federally funded transportation projects within the region. The Folsom Dam Road Access Restriction does not fall under the transportation conformity process, since it is not a road improvement project and would not be affected by this process. The alternatives that increase the emission of O₃ precursors due to delays or vehicle miles traveled would cumulatively contribute to background O₃ levels. How updates in the regional inventory or in federally funded transportation planning could affect or be affected by any of the alternatives is unknown, but effects would be minor given the relatively low total amount of emissions on a regional level described in this section.

extrapolated for the Restricted Access Alternative since traffic conditions would fall between those under the No Action and Preferred Alternative conditions.

The analysis is based on a comparison of emissions between the alternatives for four study years (2003, 2005, and 2013). The 2003 study year represents existing conditions. Emissions of criteria pollutants common to vehicle operations were estimated and include ROG, NO_x, CO, PM₁₀, PM_{2.5}, and SO₂. Emissions are based on total vehicle miles traveled for each scenario, for each study year. Impacts are discussed in Section 3.2.2, below. Vehicle emissions (passenger cars, trucks and motorcycles) were calculated using forecasts of total vehicle miles traveled for study years 2003, 2005, and 2013.

Vehicle emission factors were calculated using the most recent version of the CARB-developed vehicle emissions model, EMFAC2002, which incorporates anticipated emissions rates for future years. CARB's EMFAC2002 model shows that emission rates per individual vehicle, on average, decrease due to improvements in engine and fuel technology and the retirement of older vehicles from the fleet. Older vehicles are the highest-polluting vehicles, and the model takes into account that these cars are being replaced over time with more efficient vehicles. PM₁₀ emissions are not expected to change significantly in the future. Emission factors from EMFAC2002 were used in conjunction with average daily vehicle miles traveled (VMT) and vehicle mix data from the Transportation Project-Level Carbon Monoxide Protocol (UC Davis 1997) to calculate daily emissions. Subsequently, emissions from each alternative were compared to the No Action Alternative to assist in determining potential impacts.

The City of Folsom, in their request that Reclamation prepare an EIS on the Folsom Dam Road Access Restriction, noted that the EIS prepared for the American River Crossing project identified an alternative for that action consisting of a new bridge parallel to Folsom Dam Road. The city wrote that the American River Crossing EIS predicted increases in criteria pollutants under that alternative of 104 pounds per day of NO_x, 75 pounds per day of ROG, and potentially over 32,000 pounds per day of ozone precursors. The bridge, now known as the Folsom Dam Bypass Project, is not evaluated as an alternative for the Folsom Dam Road Access Restriction but is discussed in Section 3.11.2. However, the bridge analysis assumed six travel lanes in each direction, compared to the Folsom Dam Road Access Restriction alternatives, which consist of two lanes (No Action), two lanes with restricted access (Alternatives 2 and 3), and no access/closed (Preferred Alternative). Thus, the analysis for the American River Crossing project assumed traffic volumes that were comparatively many times higher than those used in this analysis for the Restricted Access alternatives.

Carbon Monoxide Modeling. Although six pollutants may be emitted as a result of partial or complete road closure (CO, NO_x, PM₁₀, PM_{2.5}, ROG, and SO₂), CO was modeled as a representative indicator of environmental impacts associated with the action alternatives. Local CO concentrations associated with the predicted traffic conditions for each alternative were estimated by means of an air dispersion modeling analysis using the CALINE4 model. The CALINE4 model is applied on Federal and State transportation projects and is recommended by SMAQMD for analyzing local CO concentrations at roadway intersections (SMAQMD 2004). Project and site-specific conditions are input to the model, including roadway geometry, emission sources and modeling receptor locations, meteorology assumptions, CO background concentrations, vehicle emission factors, and traffic volumes. Ambient CO levels are typically most affected nearest to congested intersections. Based on a review of the traffic study, the data available (representative or worst-case traffic intersections were evaluated in the traffic study)

and the intersections most affected or congested, two intersections were selected for CO modeling: Riley Street/East Natoma Street and Folsom-Auburn Road/Greenback Lane. These two intersections had high levels of traffic and/or potential sensitive receptors (e.g., homes) are located nearby. The modeled CO concentrations were added to 1-hour and 8-hour CO levels that were determined from existing monitoring data and derived from SMAQMD's guidelines for air quality assessment in Sacramento County (SMAQMD 2004). The modeled CO levels added to the background CO levels were then compared to Federal and State standards.

3.2.2.1 No Action Alternative

This alternative would restore traffic circulation across Folsom Dam Road to conditions similar to those described in Section 3.2.1. Under those conditions, at a regional level, criteria pollutant levels for O₃ and PM₁₀ do not meet Federal or State ambient air quality standards. The No Action Alternative would not change this status and was used as a basis of comparison for the other alternatives.

As noted previously, the regional air basin is in attainment for CO. To evaluate representative, potentially worst-case CO levels at a local or project-specific level, the intersections of Riley Street/East Natoma Street and Folsom-Auburn Road/Greenback Lane were analyzed. Table 3.2-5 lists the results for the highest predicted level of CO, showing the maximum modeled concentration generated from the model, the background CO concentrations estimated at the project location, and the total of the modeled level added to the existing CO concentration. Results are listed to compare against the Federal and State standards. Neither location exceeds the applicable standards for the No Action Alternative.

**Table 3.2-5
No Action Alternative Estimated Maximum Carbon Monoxide Concentrations**

Location	Maximum Model-Predicted Concentrations (ppm)		Background Concentrations (ppm)		Maximum Total Concentrations (ppm) (Modeled + Background)	
	1-hour	8-hour	1-hour	8-hour	1-hour	8-hour
Riley Street/ East Natoma Street	3.9	2.73	3.48	1.74	7.38	4.47
Folsom-Auburn Road/ Greenback Lane	5.5	3.85	3.48	1.74	8.98	5.59
California Ambient Air Quality Standards (ppm)					20	9.0
National Ambient Air Quality Standards (ppm)					35	9
Exceeds Standards?					No	No

In the event of a failure of Folsom Dam, transportation systems, industrial processes, and other generators of air emissions would be affected, at least temporarily. The potential effects could range from actual emissions reductions due to the lack of mobility from road closures (motor vehicles account of a large portion of daily pollutant emissions) and temporary disruptions of industry, to increases in emissions from new inefficiencies, as travel may be longer and more congested. The magnitude and intensity of the impacts may vary from location to location.

3.2.2.2 Preferred Alternative

Table 3.2-6 summarizes the difference in estimated criteria pollutant emissions between the No Action Alternative and the Preferred Alternative for the study years 2003, 2005, and 2013. The table shows an increase in total emissions for all pollutants for the years 2003 and 2005. This change is due to the additional miles traveled by vehicles within the Folsom area when comparing the total vehicle miles traveled generated by the regional traffic model with Folsom Dam Road closed against the total miles traveled with the road open. The difference in emissions is less than 1 pound per day across the Folsom regional area for most pollutants (ROG, SO₂, and particulate matter) and approximately 3 pounds per day for NO_x. Carbon monoxide shows the greatest difference at 15 to 18 pounds per day, and was modeled to determine predicted concentrations to compare against air quality standards (discussed later in this subsection). The closure of Folsom Dam Road is not expected to cause an exceedance or add to an exceedance of the ambient air quality standards for NO_x, PM₁₀, and O₃ because (1) the emissions fall within the SIP budget surplus for all three pollutants, and (2) the emission estimates for O₃ precursors for all study years are below those used by SMAQMD for determining whether further analysis should be performed.

**Table 3.2-6
Preferred Alternative Estimated Vehicle Emissions**

Pollutant	Preferred Alternative Difference	
	(tons/day)	(pounds/day)
2003		
ROG	0.00037	0.73
CO	0.0089	17.853
NO _x	0.0015	3.06
SO ₂	0.000012	0.024
PM ₁₀	0.000492	0.98
PM _{2.5}	0.000039	0.078
2005		
ROG	0.00030	0.59
CO	0.0075	15.047
NO _x	0.0013	2.63
SO ₂	0.000013	0.025
PM ₁₀	0.000068	0.14
PM _{2.5}	0.000044	0.088
2013		
ROG	-0.0014	-2.83
CO	-0.042	-84.930
NO _x	-0.0073	-14.65
SO ₂	-0.000076	-0.151
PM ₁₀	-0.00073	-1.45
PM _{2.5}	-0.00042	-0.839

Note: Analysis incorporates average emission rates that range from idle to higher running speeds.

The analysis shows a decrease in emissions for 2013 when the road is closed. The Folsom Dam Bypass Project, which is anticipated to include a new bridge below the Folsom Dam, is assumed to be completed by 2007/2008. This will change traffic patterns, rerouting cars to the new bridge and decrease VMT below existing conditions.

Total emissions for each pollutant shown in the table also decrease between study years (for example, total CO declines from 17.8 pounds per day emitted in 2003 to 15 pounds per day in 2005). This is attributed to CARB's prediction that average vehicle emission rates gradually decrease over time with the continued replacement of older, less efficient vehicles that emit higher rates of pollutants with newer vehicles. This benefit to air quality has no relationship to any of the alternatives under consideration.

Carbon monoxide concentration levels were modeled for the Preferred Alternative and are listed in Table 3.2-7. Total concentrations for the Preferred Alternative are slightly higher in comparison to the No Action Alternative, but by less than 1 part per million (ppm). The predicted worst-case concentrations would not result in an exceedance of the Federal or State CO standard at either of the two study intersections under the Preferred Alternative.

**Table 3.2-7
Preferred Alternative Estimated Maximum Carbon Monoxide Concentrations**

Location	Maximum Model-Predicted Concentrations (ppm)		Background Concentrations (ppm)		Maximum Total Concentrations (ppm) (Modeled + Background)	
	1-hour	8-hour	1-hour	8-hour	1-hour	8-hour
Riley Street/ East Natoma Street	5.1	3.57	3.48	1.74	8.58	5.31
Folsom-Auburn Road/ Greenback Lane	6.4	4.48	3.48	1.74	9.88	6.22
California Ambient Air Quality Standards (ppm)					20	9.0
National Ambient Air Quality Standards (ppm)					35	9
Exceeds Standards?					No	No

3.2.2.3 Restricted Access Alternatives 2 and 3

Both Restricted Access Alternatives 2 and 3 would allow limited traffic across Folsom Dam Road. These alternatives would have the benefit of diverting a portion of existing traffic demand across the dam, similar to but not at the same capacity as the No Action Alternative. The total vehicle miles traveled were not available from the travel model but would be slightly more than under the No Action Alternative, and would show a slight increase (in overall emissions) over the No Action 2003 and 2005 results and a slight decrease compared to the 2013 results. Both of the Restricted Access Alternatives would have total emissions less than the Preferred Alternative and would not affect the current status of any of the criteria pollutants with respect to attainment or maintenance of nonattainment classification. Traffic congestion would be slightly improved with respect to the key intersections evaluated, and both alternatives would have CO concentrations below the Federal and State standards.

3.3.1 Affected Environment

This section describes the affected environment of the portion of Sacramento County and the City of Folsom in the Folsom Dam vicinity with respect to noise.

3.3.1.1 *Noise Study Area*

The proposed project area covers the portion of Folsom Dam Road that crosses Folsom Dam along with local and regional roads affected by traffic changes since the closure of this road. Traffic on local roadways is the dominant source of noise in this area. Therefore, traffic noise is the focus of this assessment.

3.3.1.2 *Environmental Setting*

The portion of Sacramento County and the City of Folsom that is included in the study area is removed from State highways and freeways. There are no active railroad lines in the area, although an extension of the Sacramento Regional Transit light rail system is currently under construction. Although some light industrial land uses and associated noise sources are located in the City of Folsom, no substantial industrial noise sources are located adjacent to the roadways that are primarily affected by road closure–related changes in traffic. Two water treatment plants are located near Folsom-Auburn Road and near Natoma Street, but these facilities do not generate much noise. The project area is not subject to regular airport-related aircraft over-flights. Noise due to traffic on local roadways is the dominant noise source in the area.

3.3.1.3 *Regulatory Setting*

The project area includes noise-sensitive land uses in Sacramento County and the City of Folsom. Because the effects of the proposed access restrictions are evaluated under Federal environmental assessment guidelines, it is appropriate to apply Federal traffic noise impact assessment criteria. Since both Sacramento County and the City of Folsom have adopted noise standards for new land developments and other noise-producing projects, it is also appropriate to review the potential noise effects in the context of the Noise Element of each jurisdiction's General Plan.

Federal Traffic Noise Assessment Criteria

The most applicable criteria for traffic noise assessment are those established by the Federal Highway Administration (FHWA), which have been interpreted and implemented for projects in California by the California Department of Transportation (Caltrans). These criteria are contained in the October 1998 *Caltrans Traffic Noise Analysis Protocol* (the Protocol) (Caltrans 1998) and are referred to and used in this analysis to provide an established framework for the analysis of impacts. According to the Protocol, under the National Environmental Policy Act (NEPA), adverse impacts are identified, including impacts for which no or only partial mitigation is possible. Mitigation measures can be proposed to limit the adverse impacts. The FHWA regulations (23 Code of Federal Regulations [CFR] 772) constitute the Federal Noise Standard.

The unit of noise (sound) level measurement employed in this report is the A-weighted sound pressure level, denoted in decibels (dBA). The noise impact criteria are expressed in terms of the equivalent, or energy-average, hourly noise level, $L_{eq}(h)$, in dBA. In applying the FHWA criteria, the L_{eq} is determined for the design hour traffic flow, which is the highest traffic volume that will allow free flow of traffic on the roadway of concern. This is generally considered to be the traffic volume associated with Level of Service (LOS) C. Note that this is not the peak-hour traffic volume; during the peak hour, traffic may move very slowly, and the traffic noise level will be lower than during free-flow conditions.

Based on the Protocol criteria, a traffic noise impact is identified if a noise increase is substantial, which occurs when the predicted noise levels with the project exceed existing noise levels by 12 dBA, $L_{eq}(h)$. A noise impact resulting from a substantial noise increase may additionally be an adverse environmental effect. To determine the magnitude of the environmental effect, consideration is given to the context and intensity of the noise increase. Context refers to the project setting and uniqueness, or sensitive nature of the noise receivers. Intensity refers to the increase in noise levels over the No Action condition, to the number of residential units affected, and to the absolute noise levels.

The Protocol also identified Noise Abatement Criteria (NAC) that indicated acceptable noise levels. Noise impacts are considered when levels approach within 1 dBA, or exceed, the NAC. The NAC for various land uses are categorized on the basis of their sensitivity to noise (Table 3.3-1).

**Table 3.3-1
FHWA Noise Abatement Criteria**

Activity Category	NAC, Hourly A-Weighted Noise Level, dBA $L_{eq}(h)$	Description of Activities
A	57 Exterior	Lands on which serenity and quiet serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 Exterior	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 Exterior	Developed lands, properties or activities not included in Categories A or B above.
D	–	Undeveloped lands.
E	52 Interior	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

The Category B noise abatement criterion applies to residences, hotels, motels, churches, schools, recreation areas, active sport areas and parks, and is an hourly exterior sound level of 67 dBA, $L_{eq}(h)$. The Category E criterion also applies to residences, motels, hotels, schools, hospitals, and similar uses, and is an hourly interior sound level of 52 dBA $L_{eq}(h)$. The interior sound level criterion only applies in situations where there are no exterior activities that are affected by traffic noise.

For this analysis, it was assumed that a predicted traffic noise level of 65 dBA L_{eq} or more would approach or exceed the NAC at a residential receiver. Under the Protocol, if a traffic noise impact is predicted, noise abatement measures may be evaluated and considered as mitigation. Noise abatement measures may include avoiding the project impact, constructing noise barriers, acquiring property or interest, using traffic management measures, and insulating and/or air-conditioning public use or non-profit institutional structures. Preliminary noise abatement design includes acoustical considerations such as noise barrier heights, lengths, location, material, etc.

Noise abatement feasibility includes other considerations, including achieving a noise reduction of 5 dBA or greater at the impacted land uses, topography, access requirements, presence of local cross streets, other noise sources in the area, and safety considerations. If noise abatement measures are advanced for consideration, they may also be evaluated for “reasonableness,” which considers more subjective factors including the benefits, cost, absolute noise levels, changes, environmental impacts of the measures, input from those impacted, and other factors.

Sacramento County Noise Element

The Noise Element of the Sacramento County General Plan (County of Sacramento 1993) establishes an exterior noise level standard of 60 dB L_{dn} for noise generated by transportation-related noise sources. An exterior noise level of 65 dB L_{dn} may be allowed in outdoor activity areas provided that all practical exterior noise reduction measures are applied. For multifamily developments, the exterior noise level standards are commonly applied at the project’s outdoor activity area.

The L_{dn} descriptor is based on a 24-hour distribution of traffic noise and applies a 10 decibel (dB) weighting to noise measured during nighttime hours (10 PM to 7 AM). For the roadways within the project area, the L_{dn} due to traffic noise is within about 1 dB of the highest hourly L_{eq} value.

City of Folsom Noise Element

Policy 30.4 of the Noise Element of the City of Folsom General Plan (City of Folsom 1993) states that areas within the City of Folsom shall be designated as noise-impacted if exposed to existing or projected exterior noise levels exceeding 60 dB L_{dn} /Community Noise Equivalent Level (CNEL). In Policy 30.5, which relates to new development of noise-sensitive land uses, the Noise Element states that, where it is not possible to reduce exterior traffic noise to 60 dB L_{dn} /CNEL by incorporating a practical application of the best available noise reduction technology, an exterior noise level of up to 65 dB L_{dn} /CNEL will be allowed.

Other Federal Noise Assessment Criteria

Some guidance is provided by the 1992 findings of the Federal Interagency Committee on Noise (FICON), which assessed the annoyance effects of changes in ambient noise levels resulting from aircraft operations. The FICON recommendations are based upon studies that relate aircraft and traffic noise levels to the percentage of persons highly annoyed by the noise. Annoyance is a summary measure of the general adverse reaction of people to noise that generates speech interference, sleep disturbance, or interference with the desire for a tranquil environment.

The rationale for the FICON recommendations is that it is possible to consistently describe the annoyance of people exposed to transportation noise in terms of L_{dn} . The changes in noise exposure that are shown in Table 3.3-2 are expected to result in equal changes in annoyance due to noise. Although the FICON recommendations were specifically developed to address aircraft noise impacts, they are used in this analysis for traffic noise described in terms of L_{dn} .

**Table 3.3-2
Substantial Increases for Transportation Noise Exposure**

Ambient Noise Level Without Project (L_{dn})	Adverse Impact Assumed to Occur if the Project Increases Ambient Noise Levels By:
<60 dB	+ 5 dB or more
60–65 dB	+3 dB or more
>65 dB	+2 dB or more

Source: FICON as applied by Brown-Buntin Associates, Inc.

3.3.2 Environmental Consequences

This section evaluates the potential effects of absolute traffic noise levels and changes in traffic noise levels resulting from the proposed Folsom Dam Road Access Restriction.

Evaluation Criteria

The alternatives would affect traffic volumes in the project area, which would consequently affect traffic noise levels. All of the growth in traffic through 2001 was accounted for in the analysis based on local land use planning assumptions (General Plans) that are the basis for the traffic model projections.

The noise assessment determined projected traffic noise levels for each of the alternatives considered. The results were compared to local, state, and federal criteria discussed in the previous section. The Preferred Alternative and Restricted Access Alternatives 2 and 3 were also compared to the baseline No Action Alternative to determine the net impact of implementing the respective alternative.

Impact Assessment Methodology

The noise study was prepared using a combination of noise measurements and traffic noise modeling. Traffic noise measurements were performed at nine sites to calibrate the FHWA Highway Traffic Noise Prediction Model (FHWA-RD-77-108). In addition, noise measurements were performed over 24-hour periods at four locations to describe traffic noise levels at nearby residences in terms of the L_{dn} descriptor and to derive suitable day-night traffic noise distribution factors for noise modeling in terms of L_{dn} . Noise measurements were performed in terms of the L_{eq} and other statistical descriptors.

Noise measurement equipment consisted of Larson Davis Laboratories Model 820 precision integrating sound level meters, which were equipped with B&K Type 4176 0.5-inch microphones. The measurement equipment was calibrated immediately before and after use and meets the specifications of the American National Standards Institute for Type 1 sound measurement systems.

The FHWA Highway Traffic Noise Prediction Model (FHWA RD-77-108) was employed for the prediction of traffic noise levels. The FHWA model is the analytical method currently favored for traffic noise prediction by most State and local agencies. It is applied to Federal transportation and roadway projects by Caltrans. The model is based upon the CALVENO noise emission factors for automobiles, medium trucks, and heavy trucks, with consideration given to

vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site.

The FHWA model was developed to predict hourly L_{eq} values for free-flowing traffic conditions and is considered to be accurate within 1.5 dB. To predict L_{dn} values, it is necessary to determine the day/night distribution of traffic and to adjust the traffic volume input data to yield an equivalent hourly traffic volume.

Sound level measurements and concurrent traffic counts were conducted over 15-minute periods at nine sites adjacent to the major roadways in the project area. These roadway segments are adjacent to the study intersections evaluated in the traffic analysis (see Section 3.1). The measurements were conducted at a height of 5 feet above the ground to represent ground-level receivers. In some instances, the ground was elevated above the roadway. The purpose of the noise measurements was to determine the accuracy of the FHWA traffic noise prediction model in describing traffic noise levels in the project area. Figure 3.3-1 shows the calibration noise measurement sites.

The noise measurements were conducted in terms of the average noise level (L_{eq}). The measured values were later compared to the values predicted by the FHWA model using observed traffic volumes, truck mix, speeds, roadway geometries, and distances to the microphone. Table 3.3-3 lists the calibration measurement sites, and Table 3.3.4 compares the measured and modeled noise levels for the observed traffic conditions.

**Table 3.3-3
Traffic Noise Measurement Sites for Traffic Noise Model Calibrations
Folsom Dam Road Closure Area**

Site/Intersection Number	Description	Comments
1	Folsom-Auburn Road south of Dam Road (Lake Pointe Apartments)	Free-flowing traffic
2	Randall and East Natoma	Free-flowing traffic
3	Folsom-Auburn Road north of Oak Avenue Parkway	Free-flowing traffic
4	Folsom-Auburn Road near Oak Avenue Parkway	Free-flowing traffic
5/6	Riley at Scott	Signal-controlled traffic
7/8	Riley at Figueroa	Signal-controlled traffic
9	Folsom Boulevard at Natoma	Free-flowing traffic
10	E. Natoma between Stafford and Wales	Signal-controlled traffic



LEGEND

- ◆ = Calibration Site
- = 24-hour Site

Note: Not to Scale



Folsom Dam
Road Restriction EIS
18600807

Traffic Noise Level
Measurement Sites

Figure
3.3-1

**Table 3.3-4
Noise Measurement Summary and FHWA Model Calibration
Folsom Dam Road Closure Area**

Segment	Distance, Feet	Mic Height, Feet re: roadway	Posted Speed, mph	Observed Vehicles/Hour			L _{eq} , dB	
				Autos	Medium Trucks	Heavy Trucks	Measured	Predicted by FHWA Model*
1	70	7	50	1,428	52	0	71	68
2	70	5	45	1,304	16	0	65	66
3	70	5	50	2,072	24	4	69	69
4	65	8	50	2,872	16	12	72	71
5/6	60	12	35	2,508	16	4	71	66
7/8	60	5	35	2,548	4	0	64	66
9	75	8	50	3,496	36	36	70	71
10	70	5	35	1,668	16	0	62	64

*Assumes acoustically “soft” site
mph = miles per hour

The FHWA model reasonably predicted traffic noise levels for most of the roadway segments. The two notable exceptions were along Folsom-Auburn Road near the Lake Pointe Apartments and along Riley Street near Scott Street. The difference between measured and predicted traffic noise levels at Site 1 was likely due to traffic traveling at speeds above the speed limit at the time of measurement and due to the closer proximity of traffic on that six-lane road segment. This difference did not appear on the other nearby segments of Folsom-Auburn Road. At Site 5/6, the difference between measured and predicted traffic noise levels was probably due to the elevated measurement location. To conservatively model traffic noise in the vicinity of Site 5/6, a +3 dB offset was applied to the FHWA model. Given the FHWA model’s reasonable agreement with the measured noise levels at the other sites, no offset was applied to predict future exterior noise levels for the other roadways.

To describe the existing day/night distribution of traffic noise in the access restriction vicinity, 24-hour continuous noise measurements were conducted at four locations, as shown in Figure 3.3-1. The locations were selected to represent typical traffic noise conditions in the residential areas along the roadways potentially affected by the access restriction. Noise measurements were conducted in terms of the hourly L_{eq} and other statistical descriptors. Table 3.3-5 lists the measurement sites and a summary of the measured noise levels. Additional noise measurement information is presented in Appendix B.

**Table 3.3-5
Measured 24-Hour Noise Levels
Folsom Dam Road Closure Area**

Site	Date	L _{dn} , dB	L _{eq} , dB			Day/Night Traffic Distribution (%)
			Highest Hour	Daytime Average	Nighttime Average	
616 Figueroa Street	7/15-16/04	72.8	73.1	69.0	65.8	78 / 22
748 Hancock Drive	7/13-14/04	65.6	64.7	63.0	58.1	84 / 16
7013 Folsom-Auburn Road.	7/13-14/04	74.7	73.5	71.7	67.3	82 / 18
817 Oakdale Street	7/15-16/04	71.6	70.9	68.8	64.1	83 / 17

The continuous noise measurements showed that the highest observed hourly L_{eq} value was within approximately 1.5 dB of the L_{dn} value for the measurement periods. Thus, for this analysis, the calculated L_{dn} and design hour L_{eq} values for traffic noise exposures may be considered to be equal.

Inputs to the FHWA Highway Traffic Noise Prediction Model when calculating L_{dn} values include average daily traffic volume, daytime/nighttime traffic distribution, medium and heavy truck percentages, and vehicle speed. Annual average daily traffic levels were obtained from the EIS transportation analysis prepared by Fehr & Peers (see Section 3.1). Typical medium and heavy truck percentages were derived from traffic counts provided by the City of Folsom and the truck mix observed during noise model calibration. The calibration data were used to describe vehicle speeds and model offsets. The constant FHWA model inputs are shown in Table 3.3-6.

**Table 3.3-6
FHWA Highway Traffic Noise Prediction Model Inputs
Folsom Dam Road Closure Area**

Roadway	Day/Night %	% Medium Trucks	% Heavy Trucks	Distance to roadway centerline, feet *	Speed (mph)	Offset dB
Folsom Dam Road	82/18	1.5	1	50	35	0
Riley Street Crossing (Rainbow Bridge)	78/22	1.5	1	50	35	+3
Folsom Boulevard Crossing (Lake Natoma Crossing)	83/17	3	7	50	50	0
Folsom Boulevard (between Blue Ravine Drive and Iron Point Road)	83/17	3	7	50	50	0
Folsom-Auburn Road (between Folsom Dam Road and Inwood Road)	82/18	3	7	50	50	0

Table 3.3-6, concluded

Roadway	Day/Night %	% Medium Trucks	% Heavy Trucks	Distance to roadway centerline, feet *	Speed (mph)	Offset dB
Folsom-Auburn Road (between Oak Avenue Parkway and Greenback Lane)	82/18	3	7	50	50	0
Natoma Street (between Folsom Boulevard and Sibley Street)	83/17	1.5	1	50	35	0
E. Natoma Street (between Cimarron Circle and Folsom Dam Road)	84/16	3	1	50	45	0
Folsom Dam Bypass (USACE)	82/18	1.5	1	50	35	0
American River Bridge	82/18	3	1	50	45	0

*Acoustically “soft” site assumed.

mph = miles per hour

To provide a single reference point for the analysis, the distance from roadway centerline to a receiver was assumed to be 50 feet. While this distance is generally representative of the distance from a roadway centerline to a house along the roadway, it is recognized that some noise-sensitive receivers will be located closer to or farther from the road. In addition, some receivers are elevated above the roadway, which tends to increase traffic noise levels, and other receivers are behind noise barriers, which reduce traffic noise levels. However, since this analysis primarily compares traffic noise levels with and without the access restriction, those differences between receivers remain constant. The most important variable in the traffic noise exposures for the access restriction and its alternatives is the projected traffic volume. The traffic volumes for this analysis were obtained from the traffic analysis (Section 3.1), and are listed in terms of average daily traffic volumes in Table 3.3-7.

The FHWA model was used to predict traffic noise levels for each of the alternatives listed in Table 3.3-7. The predicted exterior noise levels at the reference distance of 50 feet are shown in Table 3.3-8. In Table 3.3-8, the shaded cells indicate locations where the predicted traffic noise level does not exceed the applicable standards.

The predicted changes, or net effect, in L_{dn} or Design Hour L_{eq} values are shown in Table 3.3-9. In this table, the shaded cells indicate locations where the predicted change (between No Action and the other alternatives) in the traffic noise level would be greatest.

**Table 3.3-7
Average Daily Traffic Volumes, Folsom Dam Road Closure Area**

Roadway	Pre-Closure	Post-Closure		2005				2013			
		Pre-Traffic Calming	Post-Traffic Calming	No Action	Preferred Alternative	Restricted Access Alternatives		No Action	Preferred Alternative	Restricted Access Alternatives	
						Alt. 2	Alt. 3			Alt. 2	Alt. 3
Folsom Dam Road	17,500	-	-	19,800	-	5,800	3,800	15,100	-	5,800	3,800
Riley Street Crossing (Rainbow Bridge)	36,700	44,700	46,500	36,500	45,300	40,300	41,800	34,600	44,600	41,500	42,500
Folsom Boulevard Crossing (Lake Natoma Crossing)	32,600	33,600	34,900	35,900	36,700	36,100	36,400	41,800	43,200	42,800	42,900
Folsom Boulevard (between Blue Ravine Drive and Iron Point Road)	25,700	N/A	30,600	30,200	30,800	30,800	30,800	32,500	34,200	34,200	34,200
Folsom-Auburn Road (between Folsom Dam Road and Inwood Road)	15,300	N/A	27,500	26,000	29,600	26,500	27,700	29,400	34,600	31,700	32,700
Folsom-Auburn Road (between Oak Avenue Parkway and Greenback Lane)	31,500	N/A	39,400	34,900	41,200	38,300	39,300	39,000	47,800	44,900	45,900
Natoma Street (between Folsom Boulevard and Sibley Street)	7,100	12,100	N/A	8,500	13,600	10,900	11,700	8,500	14,300	14,300	14,300
E. Natoma Street (between Cimarron Circle and Folsom Dam Road)	10,500	17,700	N/A	15,700	19,800	19,800	19,800	17,800	22,800	22,800	22,800
Folsom Dam Bypass (USACE)	-	-	-	-	-	-	-	19,600	26,700	24,500	25,200
American River Bridge	-	-	-	-	-	-	-	-	-	-	-

**Table 3.3-8
Predicted Traffic Noise Levels in Terms of L_{dn} or Design Hour L_{eq} , dB, Folsom Dam Road Closure Area**

Roadway	Pre-Closure	Post-Closure		2005				2013			
		Pre-Traffic Calming	Post-Traffic Calming	No Action	Preferred Alternative	Restricted Access Alternatives		No Action	Preferred Alternative	Restricted Access Alternatives	
						Alt. 2	Alt. 3			Alt. 2	Alt. 3
Folsom Dam Road	67.4	-	-	68.0	-	62.6	60.8	66.8	-	62.6	60.8
Riley Street Crossing (Rainbow Bridge)	74.2	75.1	75.2	74.2	75.1	74.6	74.8	73.9	75.0	74.7	74.8
Folsom Boulevard Crossing (Lake Natoma Crossing)	76.2	76.3	76.5	76.6	76.7	76.7	76.7	77.3	77.4	77.4	77.4
Folsom Boulevard (between Blue Ravine Drive and Iron Point Road)	75.2	N/A	75.9	75.9	76.0	76.0	76.0	76.2	76.4	76.4	76.4
Folsom-Auburn Road (between Folsom Dam Road and Inwood Road)	73.1	N/A	75.6	75.4	75.9	75.5	75.7	75.9	76.6	76.2	76.4
Folsom-Auburn Road (between Oak Avenue Parkway and Greenback Lane)	76.2	N/A	77.2	76.7	77.4	77.1	77.2	77.1	78.0	77.8	77.9
Natoma Street (between Folsom Boulevard and Sibley Street)	63.3	65.7	N/A	64.1	66.2	65.2	65.5	64.1	66.4	66.4	66.4
E. Natoma Street (between Cimarron Circle and Folsom Dam Road)	67.8	70.1	N/A	69.5	70.6	70.6	70.6	70.1	71.2	71.2	71.2
Folsom Dam Bypass (USACE)	-	-	-	-	-	-	-	71.7	73.0	72.7	72.8
American River Bridge	-	-	-	-	-	-	-	-	-	-	-

Note: Shaded areas indicate locations where predicted traffic noise levels do not exceed applicable standards.

**Table 3.3-9
Predicted Changes in Traffic Noise Levels in Terms of
 L_{dn} or Design Hour L_{eq} , dB, Folsom Dam Road Closure Area**

Roadway	Pre-Closure	Post-Closure		2005				2013			
		Pre-Traffic Calming	Post-Traffic Calming	No Action	Preferred Alternative	Restricted Access Alternatives		No Action	Preferred Alternative	Restricted Access Alternatives	
						Alt. 2	Alt. 3			Alt. 2	Alt. 3
Folsom Dam Road	-	No traffic	No traffic	-	No traffic	-5.4	-7.2	-	No traffic	-4.2	-6.0
Riley Street Crossing (Rainbow Bridge)	-	+0.9	+1.0	-	+0.9	+0.4	+0.6	-	+1.1	+0.8	+0.9
Folsom Boulevard Crossing (Lake Natoma Crossing)	-	+0.1	+0.3	-	+0.1	+0.1	+0.1	-	+0.1	+0.1	+0.1
Folsom Boulevard (between Blue Ravine Drive and Iron Point Road)	-	N/A	+0.8	-	+0.1	+0.1	+0.1	-	+0.4	+0.4	+0.4
Folsom-Auburn Road (between Folsom Dam Road and Inwood Road)	-	N/A	+2.5	-	+0.5	+0.1	+0.3	-	+0.7	+0.3	+0.5
Folsom-Auburn Road (between Oak Avenue Parkway and Greenback Lane)	-	N/A	+1.0	-	+0.7	+0.4	+0.5	-	+0.9	+0.7	+0.8
Natoma Street (between Folsom Boulevard and Sibley Street)	-	+2.4	N/A	-	2.1	+1.1	+1.4	-	+2.3	+2.3	+2.3
E. Natoma Street (between Cimarron Circle and Folsom Dam Road)	-	+2.3	N/A	-	+1.1	+1.1	+1.1	-	+1.1	+1.1	+1.1
Folsom Dam Bypass (USACE)	-	-	-	-	-	-	-	-	+1.3	+1.0	+1.1
American River Bridge	-	-	-	-	-	-	-	-	-	-	-

Note: Shaded areas indicate locations where the predicted change in traffic noise level between the No Action and all other alternatives is considered to constitute an adverse impact (greater than 2 dBA change).

3.3.2.1 No Action Alternative

Under the No Action Alternative, along all of the roadways analyzed except Natoma Street between Folsom Boulevard and Sibley Street, traffic noise levels at receivers within 50 feet of the roadway centerlines would continue to exceed the FHWA NAC of 65 dB L_{eq} . Given the anticipated growth and increased traffic in the study area, it is not anticipated that reopening Folsom Dam Road would reduce noise levels on the above-named streets to a level below 5 dBA. The predicted noise levels at the reference distance along these same roadways would also exceed the 65 dB L_{dn} land use compatibility criterion of Sacramento County and the City of Folsom.

Along Natoma Street between Folsom Boulevard and Sibley Street, the predicted traffic noise levels at a distance of 50 feet from the roadway centerline would be less than 65 dB L_{eq} or L_{dn} under the No Action Alternative. Therefore, noise-sensitive receivers along that roadway would not be considered subject to traffic noise impacts under the No Action Alternative.

At a regional level, the noise environment in the study area is influenced by highways and roadways. Other regional noise sources include factors such as airplane noise and industrial facilities. These noise sources are site-specific and do not have the same effects throughout the region. In the event of a failure of Folsom Dam, transportation systems and other uses that contribute to the noise environment could change. These impacts are likely to be temporary, would depend on site-specific circumstances, and may be both positive and negative in terms of noise generation. The magnitude and intensity of the impacts would have to be evaluated on a site-by-site basis.

3.3.2.2 Preferred Alternative

Under the Preferred Alternative, predicted traffic noise levels at receivers within 50 feet of all of the study roadway centerlines would exceed the FHWA NAC of 65 dB L_{eq} . The predicted noise levels at the reference distance along these roadways would also exceed the 65 dB L_{dn} land use compatibility criterion of Sacramento County and the City of Folsom. As a result, noise-sensitive receivers along all of the roadways studied would be considered subject to traffic noise impacts under the Preferred Alternative.

Relative to the No Action Alternative, the net impact of the Preferred Alternative would be increases in predicted noise levels along all of the roadway study segments (see Table 3.3-9). An increase of approximately 2 dBA is considered the threshold of an audible or perceptible change in ambient noise levels. Most of the locations modeled and listed in Table 3.3-9 were less than 2 dBA except along Natoma Street between Folsom Boulevard and Sibley Street. Traffic noise levels along this roadway may increase by up to 2.4 dB. Under the No Action Alternative, these roadways would experience lower noise levels.

3.3.2.3 Restricted Access Alternatives 2 and 3

As with the Preferred Alternative, under Restricted Access Alternatives 2 and 3, predicted traffic noise levels at receivers within 50 feet of all of the study roadway centerlines would exceed the FHWA NAC and the land use compatibility criterion of Sacramento County and the City of Folsom (65 dB L_{eq}). For study year 2005, the net change in noise levels with Restricted Access

Alternative 2 or 3 is under 2 dBA for all locations and under 1 dBA for most locations. In 2013, traffic volumes are predicted to be greater and the net difference in noise level increases is slightly higher. Natoma Street between Folsom Boulevard and Sibley Street would see noise level increases slightly over 2 dBA. The net increases for 2013 for Restricted Access Alternatives 2 and 3 are virtually identical to the Preferred Alternative at all study locations except along Folsom Dam Road.

3.3.3 Mitigation

In accordance with the Federal traffic noise assessment guidelines, if a traffic noise impact is predicted, noise abatement measures may be evaluated and considered. Although it is not a requirement under NEPA, if a traffic noise impact is found to be an adverse environmental effect, the project sponsor may implement reasonable and feasible noise abatement features to reduce the noise increase to below FHWA-established standards.

3.3.3.1 No Action Alternative

Under the No Action Alternative, noise levels would exceed Federal, county, and city standards on all roadways except Natoma Street between Folsom Boulevard and Sibley Street. As the baseline case, no mitigation is proposed for the No Action Alternative.

3.3.3.2 Preferred Alternative

Consistent with the guidelines intended to reduce the severity of potential impacts, noise abatement measures were considered for noise-sensitive receivers along Natoma Street between Folsom Boulevard and Sibley Street. As a practical matter, the noise impact area was considered to extend along Natoma Street to the intersection of Riley Street, since most traffic would continue to that point.

The noise-sensitive land uses along this section of roadway are residences, two churches, and a convenience store. The homes face the roadway and are set back about 20 feet from the property line at the street. Most of the homes have driveways, and access to the front doors of the homes is from the street.

Potential noise abatement measures for the Preferred Alternative include: avoiding the impact, constructing noise barriers, acquiring property or interest, using traffic management measures, and insulating and/or air-conditioning public use or nonprofit institutional structures.

The incremental impact associated with this alternative could be avoided by implementing the No Action Alternative. That is, if the No Action Alternative were selected, there would be no resulting increases in traffic on the affected roadway, and the noise impact would not occur. Noise barriers would not be practical for the homes along Natoma Street, as their effectiveness would be severely compromised by the necessary openings for driveways. Barriers would also impede access to the front doors from the on-street parking. Applying the Caltrans/FHWA Protocol, noise abatement measures are not considered if 50 percent or more of the affected residents do not want them. Since the affected area is historical in appearance, noise barriers would probably not be acceptable to the residents from an aesthetic standpoint. It is unlikely that it would be possible to obtain approval for noise barriers from at least half of the affected residents. Noise barriers are therefore not considered practical or effective.

Since the predicted access restriction-related noise exposures only approach, but do not exceed, the NAC, acquiring the property or interest would not typically be an option for this project. That is, the noise exposure would not be considered extreme, and there would be areas on the property with acceptable noise exposures. Interior noise levels would be expected to be within acceptable limits, assuming normal construction practices were used. Backyard noise exposures would also be acceptable due to shielding by the homes themselves.

Traffic management measures could be considered to reduce the traffic volume using Natoma Street. The City of Folsom currently closes Sibley Street between Natoma Street and Glenn Drive between the hours of 4 PM to 7 PM on weekdays. This measure reduces the demand for use of Natoma Street during rush hour, since many drivers would otherwise cross between Natoma Street and Glenn Drive on Sibley Street. The city could consider limiting access to the intersection with Riley Street from Natoma Street or some other appropriate traffic calming methods. However, such measures would likely contribute to the existing impediments to traffic flow in the vicinity of Riley Street during high traffic volume hours and would be unacceptable.

Insulation against traffic noise could be offered to the churches. However, since the predicted traffic noise levels do not exceed the NAC, and since normal construction practices would be expected to result in acceptable interior noise levels, providing additional traffic noise insulation to the churches could not be justified.

3.3.3.3 Restricted Access Alternatives 2 and 3

There is no perceptible difference in net impacts of the Preferred Alternative and the Restricted Access Alternatives. Therefore, the same noise abatement measures were considered, including: avoiding the impact, constructing noise barriers, acquiring property or interest, using traffic management measures, and insulating and/or air-conditioning public use or non-profit institutional structures. These noise abatement measures were either found not to be feasible or did not substantially reduce the magnitude or intensity of the net impact. Therefore, application of these mitigation measures for the action alternatives, including Restricted Access Alternatives 2 and 3, is not justified.

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Socioeconomics describes the social and economic characteristics of the study area for the Folsom Dam Road Access Restriction. Several demographic variables are analyzed to characterize the affected communities, including population size and distribution, the means and amount of employment, and income generation.

3.4.1 Affected Environment

Two separate study areas were used to characterize the socioeconomic resources for the Folsom Dam Road Access Restriction. The Preferred Alternative and Restricted Access Alternatives 2 and 3 limit access to Folsom Dam Road and would have direct socioeconomic effects within the City of Folsom. However, the impacts associated with the No Action Alternative are more likely to be felt across a broader geographic area covering much of Sacramento County. Thus, the City of Folsom and the County of Sacramento are the two study areas analyzed in this section.¹ The City of Folsom is within and consequently a subset of Sacramento County.

3.4.1.1 Sacramento County

Sacramento County covers a total area of 637,120 acres (995.5 square miles) (California Department of Finance 2003a). The majority of the land area is flat or rolling and is part of the Central Valley of California, which is one of the most productive agricultural regions worldwide (County of Sacramento 2004).

The southwestern-most portion of the county consists of delta lowlands between the Sacramento and San Joaquin Rivers. The county extends eastward to the foothills of the Sierra Nevada Mountains and northward about 10 miles past the City of Sacramento (County of Sacramento 2004). The City of Sacramento, which is the State Capital and the County Seat, is located on the western border of the county where the American and Sacramento Rivers meet. The Sacramento River separates Sacramento from Yolo and Solano Counties to the west.

Population and Housing

The Sacramento County population grew from 1,041,219 in 1990 to 1,223,499 in 2000, a compound growth rate of 1.6 percent per year (see Table 3.4-1). The incorporated areas of the county grew by 3.3 percent per year, and the unincorporated areas grew by 0.4 percent per year. As of January 1, 2004, the estimated Sacramento County population was 1,335,400, including 725,700 in incorporated areas and 609,700 in unincorporated areas.² The compound growth rate for the county from 2000 through 2004 was 2.2 percent per year. In 2000, there were 453,602 occupied housing units in Sacramento County, including 263,811 owner-occupied and 189,791 renter-occupied units (U.S. Census Bureau 2002).

Based on age breakdown, 28 percent of the population was under 18, 10 percent was from 18 to 24, 30 percent was from 25 to 44, 21 percent was from 45 to 64, and 11 percent was 65 or older. The median age was 34 years.

¹ Although the area of the City of Folsom impacted by the alternatives may include only parts of the city, the data presented in this section are for the entire city, which coincides with zip code 95630.

² The data for the incorporated and unincorporated areas of the county between 1990 and 2004 are not comparable because of the incorporation of Citrus Heights on January 1, 1997, and Rancho Cordova on July 1, 2003.

**Table 3.4-1
Population Statistics for Sacramento County and Folsom, 1990–2004 (Select Years)**

Area	Population			Compound Annual Growth Rate	
	4/1/1990	4/1/2000	1/1/2004	1990–2000	2000–2004
County Total	1,041,219	1,223,499	1,335,400	1.6%	2.2%
Incorporated	408,889	564,273	725,700	3.3%*	6.5%*
Unincorporated	632,330	659,226	609,700	0.4%*	-1.9%*
Folsom	29,802	51,884	65,600	5.7%	6.0%

Source: California Department of Finance Demographic Research Unit 2002, 2004.

* The incorporation of Citrus Heights and Rancho Cordova during the study period makes 2000–2004 incomparable with 1990 data.

Minority and Low-Income Populations

The racial makeup of Sacramento County in 2000 was 64 percent white, 10 percent black or African American, 1 percent Native American, 11 percent Asian, 1 percent Pacific Islander, 7 percent of other races, and 7 percent from two or more races.

In 1999, median household income for Sacramento County was \$43,816, and median family income was \$50,717. Per capita income countywide was \$21,142, with 14 percent of the population and 10 percent of families below the poverty level. In 1999, the poverty level for a family of four was \$17,027 (DHHS 2000).

Key Industries

Total nonfarm employment in Sacramento County grew by 19.3 percent between 1990 and 2000 (see Table 3.4-2). Among aggregated industries, the largest absolute growth was in jobs in companies that provide services, while the largest absolute declines were in Federal government agencies. The largest percentage growth rates were in computer systems design, waste management and remediation, and administrative and support services. The largest percentage declines were in Federal government, accounting and tax preparation, and nondurables manufacturing. The table does not include all industries, and totals may differ slightly from the sums of the columns because of rounding.

**Table 3.4-2
Industry Employment and Trends, Sacramento County, 1990–2000**

Industry	Employment		Change 1990-2000	
	1990	2000	Absolute	Compound Annual Growth Rate
Goods Producing Total	55,800	63,700	7,900	1.3%
Natural resources	300	300	0	0
Nondurable manufacturing	14,300	11,000	-3,300	-2.6%
Durable manufacturing	12,100	20,300	8,200	5.3%
Service Providing Total	409,300	491,300	82,000	1.8%
Trade and Transportation	83,100	89,500	6,400	0.7%
Information	12,900	14,400	1,500	1.1%
Financial	32,500	40,300	7,800	2.2%
Professional	45,200	78,100	32,900	5.6%
Educational	41,000	51,300	10,300	2.3%
Leisure and Hospitality	34,700	43,900	9,200	2.4%
Other Private	16,500	19,000	2,500	1.4%
Federal Government	27,900	11,300	-16,600	-8.6%
State and Local Government	115,500	143,400	27,900	2.2%
Total, Private and Public	468,500	558,100	89,600	1.8%

Major employers in Sacramento County are shown in Table 3.4-3. The key sectors represented among the employers shown are computers and computer components, government and education, health, and finance.

Despite the number of large employers shown in Table 3.4-3, most businesses in Sacramento County are small. In 2000, 70 percent of the 25,722 business establishments in the county employed fewer than 10 people, and 84 percent employed fewer than 20 (U.S. Census Bureau 2004). Among businesses that provide professional, scientific, and technical services, fully 82 percent employed fewer than 10 people, and 94 percent employed fewer than 20.

**Table 3.4-3
Major Employers in Sacramento County**

Employer Name	Industry
Apple Computer	Computer and Office Equipment
California State University	Education
Campbell Soup Company	Food Processing
Catholic Healthcare West	Hospitals
City and County of Sacramento	Government
EDS Corporation	Computer and Data Processing Services
Intel Corporation	Electronic Components and Accessories

Table 3.4-3, concluded

Employer Name	Industry
Kaiser Foundation Hospitals	Hospitals
Los Rios Community College	Education
McClatchy Company	Newspapers
Sacramento and San Juan School Districts	Education
SMUD	Electric Services
State of California	Government
Sutter Health	Hospitals
Teichert, Inc.	Engineering and Architectural Services
U.C. Davis Medical Center	Hospitals
USAA	Insurance
Vision Service Plan	Insurance

Source: California Employment Development Department 2004.

In 2000, total economic output in Sacramento County was an estimated \$72.2 billion, counting both private and public sectors (see Table 3.4-4).³ Output was greatest in the following sectors: State and local government, semiconductors and related devices, real estate, wholesale trade, and communications (excluding radio and television). The lowest levels of output that year were in costume jewelry, pipes and pipe fittings, and miscellaneous meat animal products.

Table 3.4-4
Economic Output in Sacramento County, 2000

Sector	Output (\$2000)
State and local government	\$10,864,360,000
Semiconductors and related devices	\$3,946,870,000
Real estate	\$3,120,160,000
Wholesale Trade	\$2,810,020,000
Communications (excluding radio/television)	\$2,490,390,000
New housing construction	\$2,258,870,000
Doctors and dentists	\$2,196,680,000
Insurance carriers	\$2,080,480,000
State and local electric utilities	\$1,901,360,000
Banking	\$1,767,520,000
Restaurants and bars	\$1,483,120,000
Hospitals	\$1,451,490,000
Industrial and commercial building construction	\$1,101,100,000
Automotive dealers and service stations	\$1,042,330,000

³ Government output is estimated based on a model using input-output (I-O) software from Minnesota IMPLAN Group, Inc., for calendar year 2000. IMPLAN is discussed in greater detail in Section 3.4.2 (Environmental Consequences).

Table 3.4-4, concluded

Sector	Output (\$2000)
Maintenance and repair of nonresidential buildings	\$1,035,480,000
Computer and data processing services	\$963,640,000
Engineering and architectural services	\$927,147,000
State and local government – education	\$852,317,000
Maintenance and repair of residential buildings	\$840,487,000
Management and consulting services	\$827,730,000
Credit agencies	\$821,887,000
Miscellaneous retail	\$810,927,000
Food stores	\$806,365,000
Costume jewelry	\$214,000
Pipes and pipe fittings	\$198,000
Miscellaneous meat animal products	\$ 23,000
Other	\$25,834,425,000
Total	\$72,235,590,000

Source: Input-output model for Sacramento County.

Agriculture

Over time, agriculture in Sacramento County has evolved to intensively farmed crops as well as dairy and other livestock operations. Generally, cropping patterns have shifted to greater acreages in vineyards and fruits and lesser acreages in field, seed, and hay crops. In the southern part of Sacramento County along the Sacramento River, which lies directly downstream of Folsom Dam, agricultural production still consists primarily of field crops, pasture, fruits and vineyards, truck crops, and hay and grain.

Changes in agriculture in Sacramento County have led to the development of an extensive support infrastructure for production farming. This support industry has grown both inside and outside of the county's geographic boundaries. Businesses engaged in related activities include suppliers of purchased inputs (e.g., feed, chemicals, irrigation equipment, and farm machinery); food processors; financial institutions; transportation and shipping companies; and storage businesses. Each of these sectors purchases from and sells to many other businesses.

Accordingly, the impacts of farming ripple through many sectors of the Sacramento County economy. In 2002, while farming value of agricultural production was \$275.9 million (see Table 3.4-5), total regional output attributable to agriculture was \$409.1 million.⁴ The total economic impact attributable to production of fruit (including grapes) and nuts was \$162.0 million, followed by dairy products at \$55.9 million and vegetables at \$35.6 million.

⁴ Based on data from the input-output (I-O) model used to analyze the impacts of the alternatives.

**Table 3.4-5
Production and Value of Output, 1998 and 2002**

Product Type	1998		2002	
	Harvested Acreage	Value	Harvested Acreage	Value
Apiary	--	\$159,000	--	\$55,000
Field Crops	189,054	\$37,135,000	183,653	\$49,719,000
Fruit and Nut Crops	20,184	\$110,297,000	34,050	\$104,429,000
Livestock and Poultry	--	\$27,852,000	--	\$28,819,000
Livestock and Poultry Products	--	\$51,103,000		\$38,824,000
Nursery Products	533	\$17,933,000	666	\$26,378,000
Seed Crops	7,019	\$5,290,000	5,242	\$3,775,000
Vegetable Crops	11,787	\$25,639,000	8,753	\$23,938,000
Total	228,577	\$275,408,000	232,364	\$275,937,000

Source: Sacramento County Agricultural Commissioner, various years.

3.4.1.2 Folsom

The City of Folsom is one of only five incorporated cities in Sacramento County. The City of Folsom is about 25 miles upstream from the City of Sacramento on the American River. The City of Folsom occupies an area of about 15,170 acres (23.7 square miles).

Population and Housing

Population in Folsom has grown rapidly since 1990. Between 1990 and 2000, the city experienced a 74.1 percent growth, or an increase of 22,002 residents. This increase represents a compound growth rate of 5.7 percent per year over that period. The city's growth accelerated between 2000 and 2004. In 2000, the population of the city was 51,884 (California Department of Finance 2002). As of January 1, 2004, the estimated population was 65,600, 26 percent greater than in 2000. The compound rate of growth over the period 2000 to 2004 was 6.0 percent per year, as compared with the countywide compound growth rate of 2.2 percent during that time. These statistics indicate that the City's rate of growth is relatively high and has accelerated with respect to the overall county in recent years.

In 2000, there were 17,180 occupied housing units in Folsom, including 13,101 owner-occupied and 4,079 renter-occupied units. In 2000, 24 percent of the population was under 18, 7 percent from 18 to 24, 39 percent from 25 to 44, 21 percent from 45 to 64, and 9 percent 65 or older.

Minority and Low-Income Populations

The racial makeup of Folsom is predominantly white. The city's population is estimated to be 78 percent white, 6 percent black or African American, 1 percent Native American, 7 percent Asian, 5 percent from other races, and 3 percent from two or more races.

In 1999, median household income in Folsom was \$73,175 (67 percent higher than the median household income for the county), and median family income was \$82,448 (62.6 percent higher than the county). Per capita income was 42.9 percent higher than the county at \$30,210, and only 7 percent of the population and 3 percent of families were below the poverty level, as compared

with 14 percent of people below the poverty line countywide. In 1999, the poverty level for a family of four was \$17,027 (DHHS 2000).

Key Industries

Historically, much of the Folsom area economy was based on the State prison located south of Folsom Dam. In the last 20 years, however, the structure of the local economy has changed as several major corporations have located in the city. In addition, several major retail and commercial centers have been completed or are planned, and housing construction has grown rapidly. Despite the growing trends, however, most of the businesses in Folsom are relatively small. In 2000, 74 percent of business establishments in Folsom employed fewer than 10 people and 86 percent employed fewer than 20.

With new residential development to the east and southeast of the center of the city, the geographic distribution of businesses in Folsom has also widened. Many new businesses have located closer to growing residential development in areas along or near Blue Ravine Road, the eastern area of East Bidwell Street, Iron Point Road, and Prairie City Road. This accounts for much of the growth in business since the mid 1990s. As parallel residential and commercial growth have been concentrated in these areas, traffic and congestion at these locations have been increasing since the late 1990s.

Employment comparisons between Folsom and other cities between 1990 and 2000 are not possible using publicly available data. However, employment and business data for Folsom are available beginning in 1994, and the data sets demonstrate that between 1994 and 2000, the number of businesses have been growing by an average of 60 percent per year. From 1994 through 1997, the total number of business establishments in Folsom grew by 96 and from 1998 through 2000 by another 115 (U.S. Census Bureau 2004).⁵ From 1994 through 1997, total employment in Folsom grew by 3,040 persons and from 1998 through 2000 it grew by 5,836. In 2000, total business employment in Folsom was 21,958 (U.S. Census Bureau 2004). Total payroll in 2000 was \$1,229,836,000.

During the same year, 21 percent (219) of the 1,026 business establishments in Folsom were in the retailing sector (U.S. Census Bureau 2004). An additional 13 percent (138) were professional and research entities, 11 percent (114) were in health care, 11 percent (109) were in accommodation or food services, and 9 percent (97) were in construction. Total economic output in Folsom in 2000 was \$2.1 billion, counting both private and public sectors (see Table 3.4-6). Output was greatest for the following sectors: State and local government, computer and data processing, insurance, and doctors and dentists.

Although later data are not available from the cited sources, the City of Folsom's Finance Department has indicated that the number of business licenses has increased over the last several years, indicating that the citywide growth rate is continuing.

⁵ Comparisons from 1994 through 1997 are based on the Standard Industrial Classification system, and those from 1998 through 2000 are based on the North American Industry Classification System.

**Table 3.4-6
Economic Output in Folsom, 2000**

Sector	Output (\$2000)
State and local government	\$460,343,000
Computer and data processing	\$187,852,000
Insurance carriers	\$132,760,000
Doctors and dentists	\$78,549,000
Hospitals	\$70,946,000
New housing construction	\$65,105,000
Restaurants and bars	\$62,215,000
State and local electric utilities	\$62,091,000
Automotive dealers and service stations	\$58,544,000
Wholesale trade	\$54,490,000
Real estate	\$38,599,000
Food stores	\$38,540,000
State and local government – education	\$36,114,000
Federal government – nonmilitary	\$33,141,000
Banking	\$32,712,000
Industrial and commercial building construction	\$31,736,000
Electric services	\$28,022,000
Miscellaneous clay products	\$70,000
Phonograph records and tapes	\$63,000
Costume jewelry	\$63,000
<i>Other</i>	\$653,795,000
Total	\$2,125,750,000

Source: Input-output (I-O) model for zip code 95630.

Recreation

Recreation activities in the Folsom Lake State Recreation Area (SRA) show that average annual total visitor attendance from 2000 through 2003 was 1,630,719, including boat use. Among all recreational venues in the Folsom Lake SRA, eight accounted for more than 70 percent of total visitation in 2000, with the largest numbers at Granite Bay and Beal's Point (see Section 3.8).

Folsom Lake SRA is a popular area for local recreationists, who account for an estimated 90 percent of users; out-of-area visitors account for 10 percent of users (Reclamation 1997a). No alternative recreational lakes exist within the immediate Sacramento area. Camp Far West Reservoir is 27 miles from the city, Sly Park Reservoir is 35 miles away, and Comanche Reservoir is at a distance of 40 miles.

Based on the above visitation numbers and spending profiles developed from several sources, current spending for recreation in the Folsom Lake SRA is estimated to be \$92,384,000 per year (see Table 3.4-7). Across types of recreation, the largest amounts are attributable to boating,

fishing, and swimming and beach use. Within those categories, the largest expenditures are at service stations and automotive-related businesses, lodging, restaurants and bars, and food stores.

Table 3.4-7
Estimated Annual Recreation Spending, Folsom Lake SRA, by Type of Activity

Type of Recreation Activity	Average Annual Visitor Days, 2001-2003	Annual Spending (\$Average of 2001 and 2002)
Power Boating	472,909	\$38,306,000
Other Boating	81,536	\$6,604,000
Fishing	325,144	\$26,418,000
Swimming/Beach Use	440,294	\$12,359,000
Camping	65,229	\$1,831,000
Picnicking	146,765	\$4,120,000
Other	97,843	\$2,746,000
Total	1,630,719	\$92,384,000

Sources: Annual visitor-days shown are a four-year average based on data from 2000 through 2003. Annual spending based on percentage distribution is taken from Reclamation 1997b, p. II-31, and average spending per visitor-day, by activity, is taken from National Recreation Lakes Study Commission 1999, p. 283 (1996 dollars, were updated to 2004 dollars using the Consumer Price Index for all items, all western urban consumers, as published by U.S. Bureau of Labor Statistics 2004).

Traffic and Commuting

Traffic patterns have been shifting over the past several years in Folsom due to citywide residential and commercial growth, infrastructure development, the indefinite closure of Folsom Dam Road in 2003, and subsequent actions taken by the City of Folsom to manage traffic. As described in Section 3.1, traffic congestion has been increasing over time, and the closure of Folsom Dam Road coupled with the implementation of the city's Traffic Calming Program have further exacerbated delays, affecting both businesses and residents in Folsom. Based on a reconnaissance-level survey, it is estimated that 177 businesses are located in the areas most directly affected by changing traffic patterns.

3.4.2 Environmental Consequences

This section addresses the socioeconomic impacts associated with each of the alternatives analyzed for the Folsom Dam Road Access Restriction. It is important to note that in addition to patterns of commercial growth, industry-specific demand trends, broader countywide and statewide economic trends, the introduction of new competitors in the local market, cost controls, employee productivity, and business management have all contributed to changes that have affected and continue to affect individual businesses in the vicinity of the access restriction. As such, the data represented in this section reflects the combined effect of these microeconomic and macroeconomic factors and trends, as well as effects relating to changes in traffic patterns. Because data cannot easily be segregated to attribute effects to specific isolated actions such as the proposed long-term decision regarding access to Folsom Dam Road, this section includes a framework for analysis and describes the limitations of the data sources currently available.

Framework for Estimation of Economic Impacts

The evaluation of impacts presented in this section is based on the two study areas described in Section 3.4.1. Under the No Action Alternative, immediate local impacts associated with reopening Folsom Dam Road to pre-2003 conditions are assessed. However, there are additional potential (direct and indirect) effects associated with the No Action Alternative that would have both a local impact and a regional impact to downstream resources, as analyzed in detail in Appendix D.

Indirect impacts to regional resources resulting from the Preferred Alternative and Restricted Access Alternatives 2 and 3 have not been calculated. Therefore, the impact analyses for the Preferred Alternative and Restricted Access Alternatives 2 and 3 are not strictly comparable to that of the No Action Alternative. On a regional level, it is assumed that the risk of potential adverse local and regional effects associated with the No Action Alternative can be minimized to varying degrees under the Preferred Alternative and Restricted Access Alternatives 2 and 3. However, it is not known whether the estimated local revenue reductions due to the February 2003 closure of Folsom Dam Road are being offset by revenue increases for businesses elsewhere in Folsom or in other parts of Sacramento County or other counties.

Additionally, as noted previously, it is not known to what extent estimated revenue reductions under the Preferred Alternative and Restricted Access Alternatives 2 and 3 discussed in this section can be directly attributed to limiting access on Folsom Dam Road. Other factors continue to affect local businesses. The increase in traffic congestion offers an important but perhaps incomplete explanation for the loss in business revenues in north and central Folsom. Therefore, the analysis is presented as a combined effect.

Data Sources. Several sources of data are used for the analysis presented in this section. Demographic data for Folsom and Sacramento County are tabulated from publications of the California Department of Finance. Employment data are taken from “County Business Patterns,” published by the U.S. Census Bureau. Retail sales data are taken from reports of the California Board of Equalization. Other data for Folsom have been collected from City of Folsom departments and businesses. Within Folsom, the assessment of economic impacts focused on the changes in retail sales along the roadways most affected by traffic, using survey interviews and data.

An input-output (I-O) model for Sacramento County was used to analyze the impacts of the No Action Alternative. The model was developed using a variety of State and Federal data sources, including those discussed above, and algorithms to disaggregate the data. The database associated with the model provides more detailed estimates of many variables than those available from government sources.

Input-Output Analysis. I-O analysis is a technique used to describe and analyze the nature of relationships among industries. It is based on the concept that every industry in a geographic area both purchases from and sells to other industries and to final consumers and that other sectors and industries, in turn, sell to still other industries or other final consumers. I-O models are used frequently to estimate the effects on various industries of resource changes within a region.

For the No Action Alternative, the impact area analyzed includes both the City of Folsom study area and the Sacramento County study area. Immediate effects that would restore pre-2003 conditions are predominantly local. However, the No Action Alternative also has the potential to

have widespread adverse effects, at both a local and regional level. The economic impacts analyzed or discussed include the following:

- Agriculture
- Recreation
- Water supplies
- Power production
- Business revenues and incomes
- Personal incomes
- Roads and other transportation infrastructure
- Buildings and contents
- Government expenditures

Based on the study areas reviewed, three types of impacts are considered: direct, indirect, and induced impacts, each measured relative to output, employment, and income.⁶ Direct impacts include those most directly or explicitly related to an affected sector or group. In this study, the key direct impacts are on the businesses, residents, and other entities that would be affected by an increased risk of failure of Folsom Dam (under the No Action Alternative).

Indirect impacts are those closely related to the directly impacted businesses. These impacts may be either “forward” or “backward” interindustry linkages. The former occur in cases where the products are used in the production of other products (for example, electronic components used in the production of computers). The latter occur in those cases where the impacted sector purchases from other industries (for example, businesses that produce electronic components that purchase raw materials from suppliers).

Induced impacts occur because of changes in local incomes and population. Direct and indirect impacts influence the incomes of employees of the impacted businesses. As these income levels change, they induce changes in the consumption of goods and services. In addition, induced impacts occur because of changes in population. If employment declines, some local residents may leave the area because of reduced job opportunities.

The Sacramento County model used for the analysis of the No Action Alternative was developed using IMPLAN (Minnesota IMPLAN Group 2004). IMPLAN is a system of software and databases used to construct regional economic models. It is based on I-O methodology, which quantitatively measures the interdependence among economic sectors. Each sector not only produces goods and services, but also purchases goods and services for use in the production process.

Evaluation Criteria. The level and severity of economic changes are based on context and intensity (40 Code of Federal Regulations [CFR] 1508.27). Context refers to such measures as geography, e.g. national or the affected region; affected interests; or the locality. Intensity refers to the severity of the impact and may vary depending on such considerations as beneficial or

⁶ The sum of indirect and induced impacts is sometimes termed “secondary impacts.”

adverse impacts; particular characteristics of the geographic area; and the degree to which the effects on the quality of the human environment are likely to be highly controversial.

For this study, rigorous statistical testing of impact estimates would have necessitated the use of detailed information on individual businesses for many years, and this information is not available because of confidentiality issues. Consequently, a change of 5 percent or more in output, employment, or income for the No Action Alternative was used to indicate that a marked change has either occurred or may occur.

Data Limitations. Limited data preclude a rigorous quantitative analysis of the impacts of the closure of Folsom Dam Road and a comparison between the No Action Alternative and action alternatives. The factors most responsible include the following:

- Traffic flows and congestion in Folsom have increased for many reasons, including population increases and residential and commercial growth. Much of this growth was underway prior to the closure of Folsom Dam Road.
- Activity, revenues, costs, and profits of any business are a cumulative reflection of many variables, including demand trends for the particular business and industry, intra- and inter-regional competition among businesses in the industry, costs for labor and raw materials, worker productivity, and macroeconomic trends. It was not possible in this study to distinguish between the impacts of these influences and of the closure of Folsom Dam Road. Doing so would have required obtaining and analyzing, among other data, several years of financial statements for businesses in the impact area, which was not feasible because of confidentiality.
- It is reasonable to assume that customers who patronize Folsom businesses in the impact area would purchase those goods and services elsewhere. Thus any decline in business revenues in the impact area would likely have been offset by increased revenues among businesses elsewhere in Folsom, Sacramento County, or other counties. It was not possible in this study to measure these impacts.

Evaluation of Economic Impacts

For reasons discussed above, the analysis of impacts from the No Action Alternative differs from that for the three action alternatives. For the No Action Alternative, impacts are presented in two parts. The first part includes a discussion of the direct impacts on individual sectors or measures (e.g., agriculture, recreation, or business revenues). The direct impacts are estimated using a variety of Federal, State, and local data, with assumptions and limitations discussed in the text. The second part includes a summary of the direct and total output, employment, and income impacts of the alternative on Sacramento County. Where appropriate, the total impacts are estimated by inputting the estimated direct impacts into the I-O model discussed above.

Socioeconomic Effects Since 2003

Following the indefinite closure of Folsom Dam Road in February 2003, the City of Folsom instituted a Traffic Calming Program. Together, these two actions had a marked effect on traffic patterns through parts of Folsom including Riley Street crossing (Rainbow Bridge), Folsom Boulevard crossing (Lake Natoma Crossing), Folsom-Auburn Road between Folsom Dam Road and Greenback Lane, and East Natoma Street between Folsom Boulevard and Folsom Dam

Road. Based on an informal reconnaissance, it is estimated that there are approximately 177 individual businesses along these segments.⁷

Businesses identified in the impact area were surveyed, and managers were interviewed regarding changes in their respective operations since early 2003. A number of businesses indicated that their revenues had declined, and in some cases, their viability is threatened. Residents in the area also voiced concerns over increased traffic in neighborhoods, higher risk of accidents, and the quality of air and noise in the vicinity.

As indicated previously, it is difficult to associate effects felt in the community to a single cause, such as the closure of Folsom Dam Road. Nevertheless, it is clear that segments of the community in the vicinity of the proposed action have experienced socioeconomic effects since the indefinite road closure in 2003.

Under the Preferred Alternative, the road would continue to be closed over the long term, and the combined effects of changing traffic patterns would likely continue. Therefore, the results of the surveys along with publicly available data have been used as the basis for analysis of the likely impacts under the Preferred Alternative. To a lesser extent, these effects would also apply to Restricted Access Alternatives 2 and 3 because use of the road would be constrained due to the requirements for security review of traffic.

3.4.2.1 No Action Alternative

Under the No Action Alternative, access to Folsom Dam Road would be restored to pre-February 2003 conditions. The immediate impacts associated with that action would be somewhat different from the pre-2003 conditions. Traffic levels of service prior to road closure in 2003 were below the standards set forth in the City of Folsom's General Plan. With continued projected population growth, as demonstrated in Section 3.1.2, traffic would be greater than in early 2003 under the No Action Alternative. As a result, some changes in traffic patterns may occur despite the road being accessible.

The economic output for the City of Folsom was \$2.1 billion in 2000. Assuming continued commercial growth, this number is also likely to increase under the No Action Alternative.

Under the No Action Alternative, however, the dam would be exposed to a greater level of security risk, which could result in widespread adverse environmental consequences both within Folsom and in the region. It is estimated that a combined economic loss of dam failure could be in the billions of dollars. A summary of the range of socioeconomic effects and their relative values is described below.

Agriculture

Sacramento County remains an important agricultural center. A failure of the dam could result in widespread agricultural losses and economic impacts to related industries in Sacramento County. Under this scenario, there would also be associated job losses, potentially disproportionately affecting minority and low-income populations (see Section 3.11.6).

⁷ Based on a drive-by survey conducted July 2 and July 3, 2004.

Recreation

A failure of the dam facility would also result in losses to recreation-related businesses. Effects would be felt over the short term with problems of access and associated losses of lake-related activities, and would extend until water levels were restored. Over that time, both jobs and income would also be lost.

Water Supply and Power Production

Water supplied from Folsom Lake and power produced in the area play an important role in the supply available to the greater Sacramento region. Interruption of the water supply would directly and immediately affect the region at least on a temporary basis. The impacts would depend on many factors including available supplemental or replacement supplies, and system capacities of individual districts.

Losses in Business Revenue and Income

Under the scenario of a potential dam failure, it is likely that many businesses throughout the area (both local and beyond) would experience losses for at least six months (in addition to those already discussed for agriculture and recreation) for areas that can be cleared and reopened, and losses over a much more extended time period where reconstruction is necessary.

Damage to Buildings and Contents

The failure of Folsom Dam could cause substantial damage to residential and nonresidential buildings and contents in those buildings throughout the region. These losses could amount to millions of dollars or more.

In addition to property losses, it is anticipated that a dam failure would result in extensive losses in personal incomes and damage to roads and other transportation infrastructure. Furthermore, under this scenario, there is potential for loss of life.

3.4.2.2 Preferred Alternative

A decision to continue the closure of Folsom Dam Road over the long term would result in extending the effects to residents and businesses in parts of Folsom and communities surrounding the immediate area of effect. The predominant socioeconomic impact under the Preferred Alternative would be to local businesses.

Compared with the No Action Alternative, based on primary source interviews, it is estimated that there would be a loss of approximately 21 percent in revenues among the 177 businesses located in areas most directly affected by the road closure. This would be considered an incremental effect, not present under the No Action Alternative except in the event that a dam failure occurs. If a dam failure occurs, the net impact would include and far surpass impacts associated with the Preferred Alternative, as described in the previous section.

Some individuals have indicated that they have shifted (or “offset”) their business or purchasing needs elsewhere outside of the immediate impact area. Business owners interviewed for this study discussed a reduction of known or long-term customers or clients that intended to go elsewhere. Whether a loss of any revenue discussed in this study has or may be offset by increases in other parts of Folsom, or beyond city limits, could not be defined quantitatively as it was determined to be too speculative to associate new business growth in areas outside of the

impact area to a change that could be attributed directly to the closure of Folsom Dam Road. This is based on the fact that strong business growth has continued in the city and county both before and after the road closure.

Business Revenue and Income

The closure of Folsom Dam Road has led to increased traffic congestion in several parts of Folsom as drivers have changed to alternate routes. According to analysis in Section 3.1, data show that under 2001 conditions vehicle hours of delay would have been 7.4 percent greater with the closure of Folsom Dam Road than without.

Discussions with city officials, emergency and law enforcement personnel, and individuals in public meetings indicate that congestion and commute times have increased dramatically at some roadway segments at peak periods. Some businesses report that their sales revenues have declined because their locations are less accessible than they were prior to closure of the road.

To assess these potential changes, a list of businesses was developed from a reconnaissance of the affected streets conducted on July 2 and 3, 2004:

- Folsom-Auburn Road, between Greenback Road and Pinebrook Plaza, north of Folsom Dam Road
- Leidesdorff Street
- Natoma Street from Riley Street to Cimarron Circle and from Riley Street to Wool Street
- Riley Street from Leidesdorff Street to East Bidwell Avenue
- Sutter Street, entire length

Business names and addresses were noted.⁸ Telephone numbers were then located in local phone books or Internet phone directories. Each business was contacted, and the manager was asked to comment briefly on the impacts of the closure on the firm.

Each respondent was asked the following questions, with some variations:

- Has your business changed since 2003, if at all?
- If your business has been impacted, can you approximate the gains or losses since the road closure?
- If your business has been impacted, have you hired new employees or laid off existing employees? Have you chosen not to hire or rehire employees you would normally keep on staff?
- Have you contemplated shutting down or moving your business?

A total of 177 businesses were identified from the survey: 47 on Folsom-Auburn Road, 10 on Leidesdorff, 52 on Natoma Street, nine on Riley Street, and 59 on Sutter Street. Phone numbers were found for 138 of these businesses, and all were contacted. Information was obtained from 93, and the remainder either did not return the two phone calls made or, on answering, refused to

⁸ Some businesses may have been unintentionally excluded because signage was not visible from the street or parking lot.

participate. Table 3.4-8 displays the numbers of businesses identified and contacted, by street.⁹ Note that this survey is not a complete or comprehensive survey of every business potentially affected, but does provide sufficient information to indicate trends and overall effects.

**Table 3.4-8
Businesses Identified and Contacted, Folsom, by Street**

Street	Identified	Contacted	Refused to Comment
Folsom-Auburn	47	28	0
Leidesdorff	10	7	0
Natoma	52	20	2
Riley	9	6	0
Sutter	59	32	2
Total	177	93	4

The businesses identified were in 10 general categories, including:

- Restaurants and bars
- Gifts, antiques, and collectibles
- Lodging
- Automotive
- Professional (e.g., doctors, dentists, and accountants)
- Financial (e.g., mortgages, insurance, and related)
- Beauty and spas
- Miscellaneous retail
- Miscellaneous nonretail and services
- Unknown

Discussions revealed a variety of reported changes in business. The results are reported herein as indicators of the range of potential changes that have occurred. The managers were asked to discuss these changes as distinctly associated in time with the closure of Folsom Dam Road.

Reported changes in business were wide ranging. Several businesses opened shortly before or after the closure, and the managers were unable to discern any impacts. Several others have been in business for more than 10 years and reported revenue losses and employee layoffs because of declines. Reported revenue impacts ranged from none to 60 percent. Among those businesses providing figures, the median reported revenue loss decline was 35 percent. In addition, managers that provided specific estimates said they have had to lay off 56 people and have delayed hiring another 47 (for all businesses contacted). Several managers stated that they have considered moving their businesses, some to elsewhere within Folsom and others to either El

⁹ The statistical validity of the sample was not tested. However, because all businesses on the affected streets were included, it is believed that the sample was representative.

Dorado or Placer counties. Finally, six managers said that they have already begun to shut down or to relocate their businesses, and four said that they were considering doing so.

Adverse impacts occurred to individual businesses that report that they have been “hit the hardest,” such as providers of discretionary services (gift and antique stores, for example) and retailers where individual street and small retail locations have experienced access impacts because of changes in traffic congestion. However, without citywide or areawide surveys, it is not possible to quantitatively measure the magnitude of relative impacts among different sectors of the Folsom economy. Furthermore, without information on the extent of offsetting impacts in other parts of Folsom, it is not possible to develop estimates of the overall impacts on the Folsom economy.

Table 3.4-9 provides information on the types of businesses interviewed and the sales impacts reported by each type. The impacts shown are believed to represent the maximum losses that could be experienced by firms in the area most affected by closure of Folsom Dam Road. Although indirect and total impacts of these direct effects are not estimated in this analysis due to data limitations, they are expected to represent less than 1 percent of total citywide revenues. As noted, 21 of the 93 managers interviewed reported no revenue impacts, and two reported positive (though unquantified) impacts. An additional 20 managers said they did not know or would not comment on whether the closure had affected their businesses. The largest number of businesses reporting negative impacts indicated declines of 20 to 40 percent relative to pre-closure conditions. Sixteen businesses said their sales had declined by less than 20 percent, while 10 businesses reported declines of 41 to 60 percent and two reported declines of more than 60 percent. Among all categories of businesses, those providing miscellaneous services were the least impacted, and those selling gifts and antiques were the most impacted. Data provided by the City of Folsom were consistent with the range of data obtained from managers of the businesses contacted (R. Lorenz, pers. comm., 2004).

**Table 3.4-9
Types of Businesses Contacted and Reported Percent Sales Declines**

Type of Business	Number Interviewed	Reported Sales Impact Since Folsom Dam Road Closure						
		0%	Down 1-19%	Down 20-40%	Down 41-60%	Down >60%	Unknown	Positive Impact
Restaurants and Bars	18	2	2	6	1		6	1
Gifts and Antiques	21	3	3	6	5	1	3	
Misc. Retail ¹	16	2	6	3	2	1	1	1
Misc. Services ²	11	7		1			3	
Auto Related	2			1			1	
Beauty and Spa	6	1	2	2			1	
Professional ³	15	5	3	2	1		4	
Financial and Insurance	4	1		1	1		1	
Total	93	21	16	22	10	2	20	2

Note: The data presented in this table may overstate impacts in that all businesses are weighted equally. Thus, a thriving well-run business is assumed to have been impacted in the same manner as a smaller understaffed or poorly managed business. Furthermore, it is not possible to discern to what extent increased revenues of other Folsom businesses outside the most affected areas may have offset adverse impacts.

¹ Includes, e.g., health and fitness, art and design, clothing, and houseware businesses.

² Includes, e.g., consulting, printing and publishing, private education, and laundry businesses.

³ Includes, e.g., medical, dental, accounting, and legal businesses.

Across all businesses that reported either no impacts or a decline in revenues, the weighted average decline was 21 percent. This figure and those that follow are not in dollar terms; rather, the weighting is in percentage terms only.¹⁰ The largest reported weighted declines were for gift and antique stores and auto-related businesses (30 percent), financial and insurance firms (27 percent), restaurants and bars and miscellaneous retail establishments (23 percent), and beauty and spa businesses (16 percent). The smallest weighted declines were for miscellaneous services (4 percent) and professional businesses (13 percent). The actual decline, were data available, could be larger or smaller because 20 of the 93 businesses contacted stated that they did not know or were unwilling to state the impacts of the closure on their revenues.

Several caveats are appropriate in interpreting these data. First, managers were asked for their comments explicitly on the effects of closure of Folsom Dam Road. However, without actual sales revenue data before and after February 2003 for all businesses in the surveyed area, it cannot be stated with a high degree of certainty whether the impacts reported relate specifically to the latter period. Second, population and commercial growth in Folsom since the late 1990s

¹⁰ Calculated by multiplying the midpoint of the ranges shown in Table 3.4-9 by the number of businesses for that range, adding the products, then dividing by the number of businesses.

has been concentrated in areas away from downtown Folsom. Several new housing tracts and retail and commercial malls have been developed in areas east and northeast of downtown, including those along or near Blue Ravine Road, East Bidwell Street, Prairie City Road, and Iron Point Road. It is possible that these newer businesses have contributed to some sales declines among other businesses closer to downtown, where impacts would have occurred regardless of the closure of Folsom Dam Road.

A third factor that is appropriate to consider is that traffic patterns and congestion are predominantly affected by long-term growth and the capacity of the roadway network to handle increasing traffic demands. Many of the roads and intersections studied are operating at relatively low levels of service, below the City's standard of level of service "C". Under these conditions any additional impact, even minor, results in noticeable adverse impacts because of the lack of any remaining capacity to absorb the change. The major contributors to traffic conditions that have affected businesses (depending on location) include the cumulative effects of past and continued strong growth in the area, the road closure, and subsequent traffic controls implemented with the City's Traffic Calming Program.

A fourth factor that should be considered is that some managers reported sales revenue declines as a single percentage (e.g., 10 or 20 percent), while others reported ranges (e.g., 10 to 20 percent). Absent actual revenue data for all businesses, it was necessary to show results in ranges. Moreover, 20 of the 93 managers contacted stated that they were uncertain whether the closure of Folsom Dam Road had affected their businesses.

The net effect of these caveats is that the data reported by business managers and reported herein may reflect many influences, not just closure of Folsom Dam Road. For this reason, the figures shown should be considered with caution and as subject to error.

While 50 of the 93 businesses contacted stated that their sales had declined since closure of Folsom Dam Road, only five of the 93 are considering closing or moving their operations or are in the process of doing so. The majority, 56, indicated they have no plans to close or move, six said that they are unable to do so, and 26 said either that they were considering moving or closing or that they were uncertain (see Table 3.4-10).

**Table 3.4-10
Plans of Surveyed Businesses to Move or Close**

Type of Business	Plans to Move or Close				
	No Plans to Move	Considering Moving or Closing	Cannot Afford to Move or Close	Moving or Closing	Not Certain or Other
Restaurants and Bars	11	2	1	1	3
Gifts and Antiques	8	4	2	2	5
Misc. Retail	9			2	5
Misc. Services	10	1			
Auto Related	2				
Beauty and Spa	3	1	1		1
Professional	11	1	1		2
Financial and Insurance	2	1	1		
Total	56	10	6	5	16

The responses of Folsom business managers contacted within the area most impacted by the closure of Folsom Dam Road indicate that at least half of those firms have been adversely affected by that event. As discussed above, the weighted percentage decline in sales revenues among responding businesses was 21 percent.

Effects to Other Resources

The long-term closure of Folsom Dam Road would not affect the projected population growth in the City of Folsom. As indicated by the continued growth in the number of business licenses issued in Folsom, it is anticipated that robust commercial growth would also continue in the city, although less growth may occur in the areas directly impacted by the road closure. Since there are no agricultural resources within Folsom, there would be no effect on agriculture from the Preferred Alternative. No regional effects to agriculture would result from the Preferred Alternative.

Approximately 90 percent of all recreation resource users in Folsom are from the local region, and 10 percent of the users come from other regions. As noted in Section 3.8.2.2, local recreationists may be inconvenienced by the road closure and by delays during peak congestion periods. However, as the majority of recreation use occurs after peak congestion periods, such as in the evenings or on weekends, the delays are expected to be limited.

Within this larger region, approximately 10 percent of all recreation use (measured in visitor use days) occurs at Folsom Lake (Reclamation 1997e). Folsom Lake SRA personnel have noted that there appears to be no change in recreation use at the SRA during the 2004 season due to the road closure, even though user fees have also increased. This scenario is anticipated to continue under the Preferred Alternative.

3.4.2.3 *Restricted Access Alternatives 2 and 3*

Restricted Access Alternatives 2 and 3 would provide limited traffic access across the dam, restoring some portion of the traffic circulation and pattern that existed before the closure of Folsom Dam Road. However, it would open the road only for two or three hours during the weekday commute period. Some intersections would have level of service improvements, but the effects would not be dramatically different with respect to the No Action Alternative or pre-closure conditions.

In comparison to the Preferred Alternative, there would be some benefit to businesses that have employees that could commute across the dam, or the business have service routes that can use Folsom Dam Road to better reach their customers or service areas (although the limitations on vehicle size may prevent some business vehicles, such as trucks, from using this route). Moreover, because Folsom Dam Road would remain closed on weekends, congestion during those periods would not change from current conditions. Overall, the Restricted Access Alternatives could have some beneficial effect for some businesses, but it would be minor with respect to the overall effects estimated for the Preferred Alternative.

Like the Preferred Alternative, the implementation of Restricted Access Alternatives 2 or 3 is not expected to have an impact on population or commercial growth in the city, although the pattern of geographic distribution of businesses may be affected. No local or regional agricultural impacts would occur.

Access to recreational resources may be hampered by traffic patterns and delays; however, overall levels of recreational use are not expected to be impacted in comparison to the No Action Alternative. Because recreational use would occur primarily during nonpeak traffic times and on weekends, there would be no difference in impacts from the Preferred Alternative.

3.4.3 **Mitigation**

3.4.3.1 *No Action Alternative*

No immediate measurable socioeconomic impacts would result from the No Action Alternative, though traffic may increase from the pre-2003 levels due to anticipated growth in the City of Folsom. The No Action Alternative exposes the dam to unacceptable risks of potential failure, which if occurred would have substantial short and long-term economic impacts. At this time, no mitigation for impacts associated with potential dam failure is foreseen, other than avoidance or reduction of the risk.

3.4.3.2 *Preferred Alternative*

The Preferred Alternative would result in the continued closure of Folsom Dam Road, which from an economic aspect is identified as contributing to cumulative traffic congestion impacts and subsequent cumulative impacts to some businesses' revenues. Mitigation concepts that would involve some form of alternative access across the dam to restore access to pre-closure conditions, even if restricted, would be equivalent or similar to selection of the No Action or Restricted Access Alternatives.

Reclamation has no legal obligation to mitigate for potential impacts associated with the closure of a Reclamation maintenance and facility-access road. However, potential mitigation options have been raised or requested. This EIS identifies economic changes or trends that have been reported along some of the roads where traffic impacts or changes have occurred after the closure of Folsom Dam Road and shows that these effects vary by location, business sector, and individual business. In cases where a business claims to have suffered direct losses associated with increased vehicular traffic and congestion from the Preferred Alternative, that effect would have to be individually evaluated based on a review of specific sales revenue and other data, and the effect would have to be disassociated from other cumulative contributing factors such as those mentioned above. The Preferred Alternative and Restricted Access Alternatives are under consideration because of an overall security directive, and no compensatory mitigation review program exists or has been authorized by Reclamation for security actions or for the Folsom Dam Road Access Restriction. As a result, if mitigation were to be assigned to an individual impact, funding for such measures would also require additional approvals.

3.4.3.3 Restricted Access Alternatives 2 and 3

Restricted Access Alternatives 2 and 3 would also likely have impacts similar to those under the Preferred Alternative, particularly because Folsom Dam Road would remain closed on weekends and nonpeak daytime hours (as described in Table 2-1), and congestion during those periods would not change from current conditions.

While effects cannot be fully mitigated, measures intended to reduce the severity of the impacts include evaluation on a case-by-case basis as recommended under the Preferred Alternative.

3.5.1 Affected Environment

This section describes the project area for water resources, including surface water, groundwater, and water quality.

Figure 3.5-1 shows Folsom Lake and the hydrologic features in the region. Folsom Dam Road runs across the crest of Folsom Dam, located at the southwest edge of Folsom Lake. Folsom Lake is located within the approximately 2,100-square-mile American River watershed and impounds runoff from approximately 1,875 square miles (Wallace, Roberts and Todd LLC 2003). The American River watershed stretches from central Sierra Nevada down to the Sacramento River. Snowmelt accounts for approximately 40 percent of the runoff from the watershed, and precipitation accounts for the rest (SJWD 2004).

The average annual rainfall at Folsom Lake is 23.9 inches, based on 38 years of precipitation data recorded at the National Climatic Data Center Folsom Dam station from 1955 to 1993 (WRCC 2004).

3.5.1.1 Surface Water

Water Supply

Folsom Lake provides flood control and storage for many uses including irrigation, domestic, municipal and industrial supply, electrical power generation, and environmental uses. The total storage to elevation 466 feet is 1,010,000 acre-feet (Reclamation 2004); however, the average monthly storage ranges from approximately 472,900 acre-feet in November to 838,100 acre-feet in June. Folsom Lake is one of the major facilities operated by Reclamation as part of the Central Valley Project. It accounts for approximately 10 percent of the total storage in the major Central Valley Project system facilities.

Water supplies from Folsom Dam currently meet the majority of water demands from the City of Roseville, the City of Folsom, the San Juan Water District (SJWD), and Folsom Prison. SJWD provides water to Citrus Heights Water District, Fair Oaks Water District, Orangevale Water Company, and the City of Folsom. Other entities using Folsom Lake supplies include the Placer County Water Agency and El Dorado Irrigation District.

Water Quality

The water entering Folsom Lake from the American River watershed is of extremely high quality. Monitoring of the region has found that the surface water quality rarely exceeds State of California water quality objectives for temperature, bacteria, dissolved oxygen, pH, oil and grease, total dissolved solids, and turbidity (Wallace, Roberts and Todd, LLC 2003). The City of Roseville performed a source water assessment in 2002 (City of Roseville 2003) for Folsom Lake. The source assessment, which is used to evaluate drinking water sources to determine which contamination-causing human activities the source is most vulnerable to, determined the following: “The source is considered most vulnerable to the following activities associated with contaminants detected in the water supply: Folsom Lake State Recreation Area facilities (marina, restrooms, recreational areas, parking lots, and storm drains) and residential sewer and septic systems. The source is considered most vulnerable to the following activities not associated with any detected contaminants: illegal activities and dumping, fertilizer, pesticide, and herbicide application, and high-density housing developments.”

A source water assessment was performed in 2003 for the American River downstream of Folsom Dam (CWD 2004), which determined that the source “is considered most vulnerable to contamination from sewer system spills, body contact recreation, urban runoff and discharge of regulated and unregulated contaminants. The contaminants to which the surface water sources are considered most vulnerable include the following: perchlorate, nitrosodimethylamine and volatile organic chemicals discharged into the American River by the Aerojet General Corporation.”

The lower American River from Nimbus Dam to the Sacramento River is on the 2002 Clean Water Act Section 303(d) list of impaired water bodies for mercury due to elevated fish tissue concentrations (SRCSD, City of Sacramento, and County of Sacramento 2003). However, monthly monitoring from 1992 to 2003 has shown that concentrations of trace metals meet applicable regulatory criteria at least 99.5 percent of the time (SRCSD, City of Sacramento, and County of Sacramento 2003).

3.5.1.2 Groundwater

Folsom Lake is located at the eastern edge of the Sacramento Valley groundwater basin and its North American and South American subbasins. The North American Subbasin covers the area between the Bear River to the north, the American River to the south, the Feather and Sacramento rivers to the west, and the Sierra Nevada to the east. The South American Subbasin covers the area between the American River to the north, the Cosumnes and Mokelumne rivers to the south, the Sacramento River to the west, and the Sierra Nevada to the east. Groundwater supplies in the fractured rock of the Sierra Nevada foothills are highly variable, so no major groundwater basins are defined east of Folsom Lake (DWR 2003).

Water Supply

A number of water districts rely on groundwater pumped from the North and South American subbasins. Based on values for 1990 in the North American Subbasin, the California Department of Water Resources (DWR) estimated that 109,900 acre-feet of groundwater were pumped for urban use and 289,100 acre-feet were pumped for agricultural use. The natural recharge was estimated to be 83,800 acre-feet, and the applied water recharge was estimated to be 29,800 acre-feet. The storage capacity within the 351,000-acre basin is estimated to be 4.9 million acre-feet (DWR 2003).

In the South American Subbasin, values represent an average water budget from 1970 to 1995. An average of 68,058 acre-feet was estimated for urban supply and 162,954 acre-feet for agricultural use. Net subsurface outflow was estimated to be 29,676 acre-feet per year. Natural and applied water recharge was estimated to total 257,168 acre-feet. The storage capacity calculated using an area of 243,200 acres was 4.8 million acre-feet (DWR 2003).

Water Quality

Much of the North American Subbasin contains groundwater of good quality. However, there are portions where the quality is marginal, and three sites within the subbasin are contaminated. Some locations have shown elevated levels of total dissolved solids, chloride, sodium, bicarbonate, boron, fluoride, nitrate, iron manganese, and arsenic (DWR 2003). The area along